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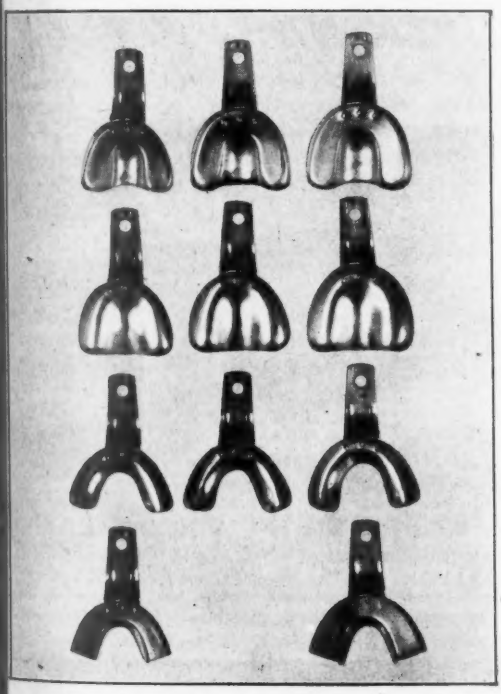

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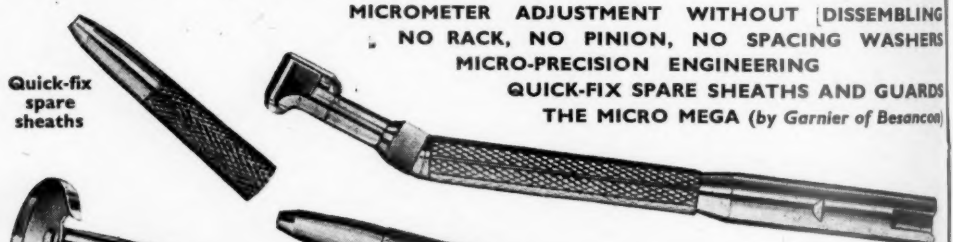

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BRITISH DENTAL JOURNAL

The Journal of the British Dental Association

VOL. LXXXVIII APRIL 21, 1950 No. 8

ORIGINAL COMMUNICATIONS

BRINGING ORTHODONTICS TO THE SCHOOL CHILD

By G. E. M. HALLETT, F.D.S. R.C.S.Eng., H.D.D.Edin., L.D.S.Liv.

Reader in Children's Dentistry, University of Durham

The title of this paper is, I realise, trite and I might have fallen back upon the old formula "Orthodontics for the masses," but something in me rebels uncontrollably at that horrid phrase and all its implications. How much malocclusion is there, and of that malocclusion, how much are we called upon to treat? Miss Smyth we remember, during her survey of several thousands of London school children for the M.R.C., had to reject 92 per cent when selecting her "normal" material. To put 92 per cent of the school population as needing orthodontic treatment would be of course manifestly absurd, but not absurd, I think, to say that all of them needed skilled surveillance, with quite often minor but enlightened intervention so as to prevent a serious orthodontic problem developing at a later date. Salzmann, quoting from a survey made at the Guggenheim Clinic 1946 of 476 children aged 2–9½, states that 50 per cent had minor malocclusions—10 per cent had Angle Class 2, or other severe malocclusions. 476 hardly seems to me to be a sufficient number upon which to draw definite conclusions, and the very mixed character of the age-groups would, I feel, vitiate the results. Nevertheless, one feels that the figure of 10 per cent quoted for severe malocclusions must have been a minimal one, for many of the 2- and 3-year-olds must subsequently have come into the category. To return to British subjects. In a comprehensive survey of school children in widely separated areas, Mr. Ainsworth, investigating the incidence of dental disease in children for the M.R.C. in 1924, reported that antero-posterior malocclusions, unilateral or bilateral, were found in 23·2 per cent of all children examined. However, Mr. Ainsworth classified many cases as normal where antero-posterior discrepancies of molar relationship had occurred as a result of early loss of the deciduous molars, and excluded most of Bennett's Class 1 type of malocclusion. When this is taken into account, malocclusions present, needing treatment, must rise considerably above the figure of 23 per cent.

Other investigators have been Mr. Breakspear reporting on 200 unselected cases in 1943, Mrs. Michaelis reporting upon 233 cases in February 1945 and Miss Sclare investigating malocclusions in the age-groups (8 and 12) in a survey of 650 children.

Again the numbers are small and direct comparison of the different sets of figures is not advisable, for they lack much common data.

One feels that at least 1,000 children should be examined and that preferably 2,500 would give a truer picture. However, Mr. Breakspear commenting upon Miss Sclare's survey says:

> "Three different investigators working independently on unselected material in different parts of the country agree in finding approximately 20 per cent of the children examined by them to be in need of orthodontic treatment with apparatus. If these figures are representative, it means that one in every five school children ought now to be wearing an orthodontic appliance. Even when allowance has been made for those who would be unwilling or unsuitable subjects for treatment, there must be hundreds of thousands of children in this country who are growing up with deformed mouths for lack of skilled attention at a cost within their means."

Since writing the above, Professor Humphreys and Mr. Leighton have published some interesting observations conducted upon 3,380 pre-school children between 2–5. They found that about 25 per cent showed some degree of

postnormality and 1·5 per cent had prenormality.

One is left with the inescapable conviction that it is time that a full survey was begun on British children in adequate numbers, in order to find out the distribution of certain well-defined types of occlusal mal-relationship such as Class 2, Divisions 1 and 2; Class 3; open bite, habit deformities, etc., in the later age-groups. Only thus can the amount of malocclusion present in our child population be fairly assessed. Now in all this it must not be forgotten that there are two sides to the picture: the subjective and objective. For example, the dental surgeon may be convinced that he ought to interfere in a Class 2, Division 2 case of moderate severity. He may instance increased caries hazards, occlusal inefficiency, early loss of teeth from parodontal disease, and, of course, the disfigurement arising from misplaced teeth. Yet the child, or more accurately the parent, may remain unmoved. Æsthetic appeal is probably the most powerful weapon in our propaganda armoury. Indeed, parents can be embarrassingly grateful at having the child's twelve anterior teeth aligned —even though one is not a little mortified by a disappointing occlusal relationship of the molars. Premolar and molar malocclusion mean very little to the layman. It must never be forgotten that quite gross malocclusion can, in certain instances, be compatible with longevity of the teeth. I am constantly reminded of this fact when I see one of our older dental teachers, now retired, who still has, to the best of my knowledge, all or nearly all of his own teeth. Yet those excellent teeth are extremely irregular and although his occlusion is highly traumatic, the parodontal tissues are almost aggressively healthy and firm. Amongst a group of school children from an independent school at a social function recently, I could not but be conscious of the number of Class 2 and other severe malocclusions present. Yet only a small number of those cases I knew were receiving orthodontic treatment. What is the reason here? Not a question of income certainly, for I feel sure that medical attention in other directions was not lacking, but apparently parental indifference: "Jean takes after her daddy so it can't be helped"; or parental cynicism, often justified, "I wore a brace when I was a girl but my teeth went back as soon as I left off"; or sheer inability to get skilled attention for lack of specialists; or, finally, a careful weighing up of the advantages to be gained by treatment against the loss of school time occasioned by attendances at the dental surgeon's, and putting the school factor as the higher.

Number of Orthodontists Required

If we take 10 per cent of the school children as not only requiring orthodontic treatment but desiring it themselves, and I do not think that this estimate is excessive, and limiting the age-groups from 8–14, we get a figure of about 3 million children of whom 300,000 require active treatment. Our next difficulty is to compute the number of cases an orthodontist may reasonably be expected to treat. Here again, there is a great divergence of opinion. A well-known American orthodontist, whose advice I sought upon this point, told me that he could have up to 100 cases upon his treatment lists at any one time. On such a reckoning we should need for the treatment of our children something like 3,500 orthodontists or 25 per cent of the total register! Now I realise, of course, that this applies to American orthodontic private practice in its most exclusive and expensive form. On the other hand, Mr. John Heath of Australia, who has always given much consideration to the wider application of orthodontic treatment to all who need or require it, has recently said that by careful organisation and systemised methods of treatment, a dentist may accept up to 100 new cases per year (or on a 46-week year a little over 2 new cases each week), though he does not commit himself as to the total number of current cases that he may have on his books at any one time.

In order, then, to ascertain the number of patients that an orthodontist may treat, I have made some calculations and have come to certain conclusions which I put forward in no dogmatic but rather a provocative spirit, for I think it is high time that we cleared the air upon this point.

Some may think the figure too low, others that it is too high; but at least it will provide a starting point for argument. I have arrived at this figure in two different ways. Firstly, by enumerating on a time basis for individual operations the amount of time consumed in orthodontic treatment by an average case; and here may I say, that by average, I visualise the case that comes to our surgery 9 times in the first year, 6 times in the second and 4 times in the third. Table I shows how I have apportioned the time for the various operations. The result of this calculation is to indicate that an orthodontist may have about 760 cases upon his books and that, if he were starting an orthodontic practice, over the first four years he might absorb 4 new cases per week. Once, however, he has reached his total of 760 cases, then he must limit his new patients,

TABLE I.—TIME PROGRAMME SHOWING APPORTIONMENT OF TIME FOR ORTHODONTIC CASES AND THE NUMBER WHICH EACH ORTHODONTIST COULD UNDERTAKE

Visit	Time Mins.	
1	30	Inspection-Study impressions. (If Radiographs, plus 15.) Rough history, etc.
2	15	Diagnosis (Average). Many ½ hr. Some only 10 mins. Initial appliance construction. 10 mins. per band = 20
	30	Impressions . . . . . = 10 } 30
3	20	Cement appliance—Instructions 20 Fit removable—Instructions . . 20
4, 5 6, 7 8, 9	90	Subsequent visits, refreshing memory re details, card entries, adjustments. Advice to parents/child. 6 per year = 6 × 15 = 90
	15	Yearly impressions 15
	90	2nd Year 6 × 15 mins.
	60	3rd Year 4 × 15 mins.
350 or about		6 hours' individual attention over 3 years. 3 hours 20 mins. First year 1 hour 30 mins. Second year 1 hour Third year

Each case consumes 6 hrs. over 3 years.
Yrs. Wks. Hrs.
$3 \times 46 \times 35 = 4554$ working (Chairside)
Divide by 6
= 759, say 760
i.e. one orthodontist can have 750–800 cases (current) on books.
In first year case takes 3⅓ hrs. p.a. New patients. 12½ hrs. per week.

There are 575 p.m. hrs. in year (46 weeks) ÷ 3⅓ hrs. (1st yr. demands) = 172·5 cases
or 4 new cases per week.
This is probably an absolute maximum operating in the expanding first 4 years only, thereafter reducing to 3 or 2 new cases per week.

in fairness to the other patients still undergoing treatment, and his ultimate absorption must be in the region of 2 new cases per week or 100 per year as Mr. Heath suggests.

Here I must point out that these estimates are only valid in so far as the problem is greater than the means of dealing with it. Postulating a three-year average period for active treatment of the specialist type case, and assuming an ideal of 400 specialists working under ideal conditions, then after the first three or four years we would have to consider only 10 per cent of three age-groups. 200–240 orthodontists might then conceivably keep the problem under control. However, as it will take many years to build up anything like this number of specialists, and as the demand for treatment and advice will undoubtedly grow enormously, and as all patients should be reviewed over a further period of at least three years (if only once per annum in the last two), and as it may be desirable for the average number of cases per orthodontist to be less than 750—then I feel that we should aim at 400 as the minimum required to keep malocclusion problems under control.

During the first year, of course, the patient occupies more chair-time than in any other year, and it must be noted that though it is not possible to take into account such factors as a patient changing to a more complicated appliance in the second year, or completely breaking a twin arch assembly by careless use, these things do happen and lengthen materially the time taken over a case. This should not be forgotten for it is bound to happen in an appreciable percentage of cases.

Table II shows that if an orthodontist sees all cases four times per annum, that is once in every 11½ working weeks, and sees 10 patients a day, he can see 578 cases in those three months.

TABLE II.—CALCULATION SHOWING THE NUMBER OF CASES WHICH CAN BE TREATED IN EACH YEAR, AND THE NUMBER OF ORTHODONTISTS REQUIRED FOR A FULL SCHEME

See all cases at least 4 × p.a.
$\frac{46 \text{ working weeks}}{4} = 11\frac{1}{2}$ weeks.
See 10 patients per day
$= 10 \times 5 \times \frac{23}{2}$ (weeks) = 577·7.
say 575 cases.
N.B.—10 patients *p. diem.* 6/10 hrs. or 36 mins. each, or ½ hour each and 5 mins. between.

See 16 patients per day.
$16 \times 5 \times \frac{23}{2}$ weeks = 920.
N.B.—16 patients *p. diem.* 22 mins. each or 20 mins. per case and 2 mins. between.

Average again 750 cases per orthodontist.
Estimating 3 m. children 8 age groups 8–15
10% = 300,000
and each orthodontist being responsible for 750 children $\frac{300{,}000}{750} = 400$,
i.e. 400 fully trained and occupied orthodontists could deal with the major part of the population's malocclusion.

10 patients per day means 36 minutes per patient, or, say, 30 minutes each and five minutes between cases to clear the surgery and refresh the memory about the next case. On a higher estimate of 16 cases per day, it means that 920 cases may be seen. This gives each patient 20 minutes in the chair and allows only 2 minutes between. For specialised orthodontic prac-

tice, 16 cases per day is probably the upper limit, and 10 cases per day the lower limit. So that between 576 and 920 we have again our average figure of roughly 760 cases as computed by the other methods.

To progress a little farther, I have postulated a minimum of 10 per cent of the school population as requiring advanced orthodontic treatment. If we take the most valuable years for this treatment as being, say, 8–14 inclusive, that is to say, 7 age-groups, we have out of three million children 300,000 to be treated. Taking 750 as a maximum number per orthodontist, we therefore need at least 400 full-time orthodontists to tackle the enormous problem in this country. This leaves, to my mind, a great deal of orthodontic work to be done which may very well, and even desirably, be carried out by the private practitioner, notably the school dentist, who is, or who should be, a child specialist in no mean sense. It is, then, the job of the general practitioner and the children's dentist to plan treatment of the child initially so that all incipient occlusal anomalies are recognised at the very earliest stage, and reported to the parents. They should be kept under skilled surveillance by regular reinspection until such time as they may be referred to the orthodontist; and in the meantime it should not be considered outside the powers of such practitioners to deal with minor forms of malocclusion, such as, say, an instanding incisor. It is to that end that we are putting so much more emphasis in the schools upon the preventive side of children's dentistry, developing, we hope, occlusal consciousness in our young practitioners. There they see the dire results of early loss of deciduous teeth, the value of space maintainers and so on. They are also able to observe the major anomalies treated by recognised methods. If the orthodontists are going to be so fully occupied with dealing with the 10 per cent who exhibit the grosser forms of malocclusion, they must have the full co-operation and understanding of the general practitioners. At the same time the orthodontists must put their own house in order, so that their diagnoses are more accurate, their treatments more skilful, their "philosophies" less numerous, but more effective, and their results more stable! Here again we look to post-graduate training to produce such men and it is encouraging to know that a start has already been made in this direction.

Organisation of Orthodontic Treatment

How are these orthodontists to bring their treatment to the children in the most effective way? There are at present several possible ways to be considered. Firstly, there is the private specialist practitioner who is outside the National Health Service. He can only bring his services to a limited number of patients who can afford his treatment—which invariably is expensive. He, therefore, cannot make any material contribution towards dealing with the great mass of work needed. Heath has recently suggested that in most countries only 2 per cent of those needing orthodontic treatment actually receive it. Specialist private practice of this nature of necessity postulates high expenses and, therefore, high fees. The general practitioner, too, is far too occupied with the many varied calls of private practice to devote more than a minute amount of his time to orthodontic work. His experience must naturally be very limited, especially during his first ten years in practice, and his skill and judgment must fall short of acceptable requirements. The general reluctance of most private practitioners to undertake any but the simplest of regulation cases is proof of this. Some use has been made in county areas of what I might term the peripatetic orthodontist, who, by travelling round in a consultant capacity, deals with those cases selected for him at some prearranged session by the public dental officer. There are advantages and disadvantages to this scheme (Table III). But on the whole I feel that the disadvantages outweigh the advantages. Though it is a great convenience for the ortho-

Table III.—Arrangement of Work of Peripatetic Orthodontist. Advantages and Disadvantages.

	Peripatetic Orthodontist
P.D.O.	Central Surgery and Laboratory
P.D.O. Supplies models and ? initial skiagrams	Portable X-ray outfit, camera, lighting (Welder) Sees, and if possible, diagnoses cases at clinic in consultation with P.D.O. Back at laboratory
Imps. for appliance ? Bands for fixed appliance (Welder)	Designs appliance and passes to technician who may make indirect bands himself Post to P.D.O.
Inserts removable. Cements fixed. Adjust	Subsequent visits. Inspects cases under active treatment and also finished cases

Advantages	Disadvantages
Maximum convenience to patients	Much time lost by specialist travelling
	Patient can only be seen infrequently by specialist
Opportunity for P.D.O. to practise orthodontics	Adjustments and interim decisions may be made inexpertly
	Much correspondence and delay probable
	Cephalometrical investigation still needs attendance at central clinic

dontist to be brought to the patient, it must not be forgotten that specialist's time is a very valuable commodity and many precious hours may be frittered away needlessly in the train or in the car, travelling between the headquarters and the dental centre. An advantage is that the experience and advice of the specialist is brought in a more intimate manner to the dental officer, who may thereby derive much information and instruction and often inspiration to specialise himself. His interest in the case is heightened and he is liable to carry out adjustments more efficiently. However, one of the biggest drawbacks to this method of treatment is that the specialist can only see his case at very infrequent intervals and owing to the duplication of records, at the dental centre and at headquarters, analysis of case results may be very difficult to make. On balance, therefore, I cannot accept this as a very satisfactory solution to the problem. There is another form of orthodontic advice to which I feel bound to refer at this point. There seems to be some possibility of specialists acting in a consultant capacity to other practitioners and receiving remuneration from them much in the way that the barrister derives his fee through his solicitors. There is, I think, a distinct danger here of diagnosis being made upon the casts of the patient's mouth alone and this practice cannot be too strongly deprecated; even if reliable skiagrams are forwarded at the same time, there is still too much room for error. Orthodontic decisions involve so many variables and imponderables—not the least of these being the general quality of the hard dental tissues—something which it is very difficult to convey adequately upon the plaster cast for such a system to be satisfactory. Of what use is it to conserve molars of poor quality, remove premolars, only to lose the first permanent molars one by one between the ages of 15 and 20? Yet this can so easily happen. Nor do we wish to see the practice, as happens in America, of mechanics to the profession supplying appliances of doubtful design "for your difficult cases" !

No! in all cases, the patients must be present, together with the parents in person, for initial diagnosis.

I now pass on to what I have come to consider as the most practical way of bringing orthodontics to the school child. The very first requisite, of course, is to train our dental surgeons in the schools in the wider field of dentistry, as I have previously mentioned, developing in all of them that sense of occlusal consciousness and power of automatic observation, so that every maxillary disharmony and each malocclusion is recognised; every missing tooth accounted for and in all cases some definite action taken, even if it amounts to no more than pointing out the trouble to the parents, giving advice and noting this on the treatment record card. And may I add that the advice should not be to wait till 13 or 14—if, when the orthodontist does eventually see the child, he will say "it is now too late" ! Suitable students can then go forward into the public dental services where they may, by the skill and excellence of their services, avoid many malocclusions and divert the worst forms in time to specialists. This brings me to the form of specialist advice for the large number of children who need and desire orthodontic treatment.

Orthodontic Centres

I am firmly of the mind that this can best be done by setting up specially organised centres which would be under the control of the Ministry of Health and work for the private practitioner services and public dental officer alike. To cope at all with the work to be done we need something like 400 specialists, and these would be distributed on a population basis; for instance, in a city of 60,000 child population, we might have a centre set up on the lines set out in Table IV.

Table IV.—Requirements of Orthodontic Clinic in Large Town

CHIEF + 3 ASSISTANTS

2 TRAINEES	1 Technical Assistant
4 Dental Attendants	3 Technicians (Dental Mechanics)
Secretary	

Chief Orthodontist would :

1. Review all cases (models, skiagrams) with chief assistant
2. Prescribe treatment
3. Delegate the majority of mouth procedures to assistants
4. Check progress of cases
5. Supervise laboratory through chief assistants
6. Collate record material for research investigations
7. Maintain liaison with G.P.s and P.D.O.s, etc.

Required : 4 surgeries, X-ray room, photographic room, cephalometer
Laboratory for 3 technicians
Storage space for 3,000 boxes of models

It would be a self-contained unit especially for the purpose of giving orthodontic treatment and would be staffed by a team composed as follows: the Chief Orthodontist who would be in charge of the direction of the unit and be responsible directly to the Head of the Orthodontic Services at the Ministry. On his staff he would have his senior assistant and two other assistants, comprising 4 specialist orthodontists in all. Each would have surgery assistants

and there would be at least 3 technicians needed for the purpose of making appliances and maintaining the records, models, etc. It is often forgotten what an important part of the orthodontic treatment is formed by these records. Record charts must be very carefully prepared and as carefully stored. At the end of treatment the series of charts, together with the diagrams, photographs, and all other relevant material should be carefully reviewed in the light of past treatment. A frank judgment should be made of this and errors of judgment punctiliously recorded, so as to diminish the possibility of future similar errors. If in the past we had been a little less thrasonical about our good cases and a little more outspoken about our failures, the art of orthodontics would, I am sure, be in a more advanced state than it finds itself at present. All this valuable work is none the less a great time consumer and some form of technical staff would be absolutely essential to make the collection of records automatic and therefore immune from the periodic breaks in continuity which inevitably occur when the filing of records is dependent upon the spare-time enthusiasm of the professional staff. The general technician could be trained to carry out the duties of photography in special cases and he could also prepare the charts of these cases in a suitable manner for photography and permanent collection. I have shown two trainees as being on the staff. These trainees would very likely be public dental officers who are training to be specialists in children's dentistry, spending an adequate period at the centre (not less than six months) so as to acquaint themselves thoroughly with the type of work undertaken and methods of treatment, and thus broaden their outlook upon children's dentistry in general. They would assist in treatment, carrying out mouth procedures under supervision and also construct a number of appliances. They would assist in the examination of radiographs and in the delineation of diagrams. On their return to children's dentistry they could not fail to be better practitioners.

A fair proportion of them would derive such inspiration and show such promise as to go forward on the recommendation of the Chief Orthodontist, to become full-time specialists themselves. It is to be hoped that the universities will come into the picture by setting the seal of professional competency upon them, offering post-graduate courses and diplomas in orthodontics. These diplomas must not be won easily and must, to be of value, demand previous specialist training extending over several years, otherwise they will mean nothing.

In the cities where dental schools are already established a very close co-operation should be maintained between them and the orthodontic teams. One of the great difficulties of orthodontic teaching is that it suffers as a result of the great demand made upon the teachers by too much clinical work. It is not desirable that the Teaching Department should have to deal with every case sent to it. According to its size, there is needed an adequate supply of all the usual types of dental deformity according to present systems of classification, and also a number of those of obscure ætiology and unpredictable prognosis. The teaching must not only be complete as to variety of types of malocclusion but also as to quality and thoroughness of diagnosis and of subsequent treatment. By thus restricting the volume of work, the standards of graduate comprehension of a case would be much higher and the teachers would be in a position to make sounder judgment upon, and more scientific conclusions from, their cases; and the child—that most important individual of all—would benefit enormously. But these are administrative details which can only be sketched broadly and upon which I must not dwell in detail once I have established my contention that the most efficient and the most effective way of bringing orthodontics to the school child is by the setting up, all over the country, of these specialist centres as an integral part of the General Health Service, staffed by specialist orthodontists working in full co-operation with our school dental services, private practitioners, and lastly, but by no means least, our dental schools.

Conclusion

Four hundred fully trained and fully occupied orthodontists could deal with the main part of the population's malocclusion.

The other attack upon this problem is the preventive one. Children's dentistry carried out in its fullest sense, as it should be, embraces diagnosis of incipient malocclusion, conservation of teeth at an early stage of decay (in itself an important malocclusion preventive for certain forms of irregularity), and the treatment by the public dental officer of simpler forms of irregularity which may be easily corrected in a matter of a few months. This leaves the more difficult forms of treatment for the specialists. It is of course essential, for the full value of this preventive service to be obtained, that the school dental officer be not only *fully* trained, but also shall have done a post-graduate course in children's dentistry.

Application

(1) The School Dental Service, accurate diagnosis, preventive methods and treatment of simple irregularities.

(2) The specialist.

Specialists work most economically in small groups. They thus share technical (mechanical), radiographic and other personnel. In especially difficult cases there is the advantage of a second opinion being available—and, apart from this, discussion keeps the mind active and away from the dangers of becoming unreceptive to progress. In densely populated areas—they should work in an orthodontic centre. In less densely populated areas an orthodontist may have to work on his own at some convenient central place.

In sparsely populated areas he may have to visit centres by car but this is the most wasteful method, much time being lost travelling, assembling apparatus, etc. He will still need a central laboratory and surgery of his own.

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THE CLINICAL DIAGNOSIS OF DENTAL CARIES

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The experimental study of dental caries is possible in two ways. One is in the laboratory and the other in the clinic. The former method presents problems largely common to all human research. Either a human tooth must be examined outside its natural environment or work is done on animals none of which so far used is susceptible to caries as is the human, and none of which has a metabolism sufficiently close to that of the human to warrant any precise analogy.

The logic of the laboratory technique is universally known. Precise standardisations of controls and variables render results more capable of exact interpretation, but in dental research the results must strictly apply to a human tooth outside its natural environment, or to a tooth of the particular animal under investigation. It is quite clear that any method of prevention must eventually be applied to the human for final substantiation, and it is in the clinic that any theory or hypothesis concerning the ætiology of dental caries must be tried and proved before there is any universal acceptance.

The clinical method of investigation is quite different from that of the laboratory. Owing to a multiplicity of uncontrollable factors precise standardisations as obtainable in the laboratory are not possible and results are often more difficult to interpret. Thus, for the correct elucidation of clinical data we have to employ the statistical method which is a method "... specially adapted to the elucidation of quantitative data affected by a multiplicity of causes" (Yule and Kendall, 1946).

The statistical method is intimately connected with experimental design, in fact they "... are only two aspects of the same whole" (The Design of Experiments, Fisher, R.A., 1942). Logical inferences are not possible from data obtained from an experiment of faulty design, no matter how accurately they are obtained. Neither are they possible from data intrinsically unsound even if the experimental design has a logical structure.

It is of fundamental importance, therefore, that considerable attention should be paid to the diagnostic procedure which provides the basic quantitative data.

The usual implements of diagnosis are the mirror and probe, and the radiograph, but the technique of diagnosis has never been satisfactorily standardised.

It is not intended to enter into a detailed discussion of methods other than the clinical method, but brief mention should be made in order to evaluate the relative importance of the clinical procedure.

Exponents of the Michigan school claim that it is possible to state whether active caries is present or not by taking a lactobacillus count. A negative count is diagnostic of immunity and a positive count indicative of the presence of active caries or a true prognostic indication of the clinical condition from three to six

months later (Enright and Friesel, 1933), information which has some value but which is of insufficient precision for research work. The colorimetric method of Snyder (1940) is based on the relative numbers of lactobacilli in saliva, and the same objection exists. It is true that Winkler and O. Backer Dirks (1946) claim to have obtained a statistical correlation between the number of lactobacilli and a modified Bodecker Index, but this result is not compatible with those of others who have failed to find such a correlation, and have related the counts to a future dental condition. Further, there are several serious objections to their modification of the Bodecker Index. For instance, they recorded as carious, all discolorations, and decalcifications which might be estimated as pre-carious, a procedure open to considerable doubt. Burrill (1943) concluded that whereas the bacterial and yeast counts of the Michigan school, and the chemical methods of determining caries susceptibility (devised by Fosdick and Hanson) related something to caries susceptibility, one or both cannot claim to be a reliable measure of caries susceptibility itself.

The use of radiographs in diagnosing caries can only be considered as a very useful adjunct to the clinical method. The extent to which they alter the caries score is difficult to define except in a broad measure. Day and Sedwick (1935) discovered 23 per cent more approximal cavities by radiographs, and Sognnaes (1940) found that radiographs increased the score of carious lesions (not carious teeth) by 5 per cent. Fixott (1937) found the increase to be between 25–40 per cent, and Delabarre (1933) stated it to be 50 per cent.

There is really no precise error which can be defined, and it is highly likely that the widely varying results which have been reported are largely due to differences in the accuracy of the clinical diagnosis. All these results which have been reported relate to carious lesions and not carious teeth, and consequently it is most probable that the difference is much less if carious teeth are considered, because many teeth will have both clinically detectable lesions, and lesions only detectable by the radiograph. If lesions are considered in such instances there will be an increase, whereas, there would be no increase if the D.M.F. index were used.

In the absence of a more satisfactory technique the clinical research worker must place considerable reliance on the clinical method of diagnosis, whether radiographs are used or not. No special difficulties are usually described in the clinical diagnosis of dental caries and, indeed, in the grosser manifestations there can be but little doubt. Many clinical research workers and investigators make no particular mention of their diagnostic procedure beyond stating the use of a mirror and probe. Some are content with a naked-eye inspection (Murray and Wilson, 1942), and Allen (1941) states "... that owing to a lack of time it was not possible to explore every tooth thoroughly with a probe: the teeth were also, in some cases, very dirty so that very early caries must be overlooked." Wilkins (1941) in an attempt to correlate caries and poverty did not use a dental probe or mirror, but some undescribed probe and tongue spatula. Such sketchy procedures quite obviously place results in the shadow of scientific doubt.

Even when greater care is taken, errors occur and opinions can vary. Deatherage, Wilson and Ledgerwood (1939) pointed out the importance of realising this variability. In a preliminary investigation they set out to answer two fundamental questions :

"... 1. If an individual is examined by several, presumably equally competent dentists, how closely can we expect the diagnoses to agree ?

2. If two groups of persons are examined by different dentists and a difference in the number of carious teeth is observed, what statements are we justified in making about the relative dental condition of the two groups ? ... "

Five staff dentists of the Division of Dental Health Education of the Illinois Department of Public Health examined 63 orphanage children. The examinations were carried out " as in the field " without any adjuncts to the usual clinical procedure. A fissure or pit was counted as carious if it caught the probe. The results are briefly given as follows :

(1) The total number of carious teeth in the 63 children was found by each examiner to be 213, 225, 157, 291, and 250 respectively.

(2) The number of " caries free " was found by :

Examiner 1 to be 11
Examiner 2 to be 12
Examiner 3 to be 22
Examiner 4 to be 3
Examiner 5 to be 7

(3) Out of the possible ten comparisons between the results of one examiner and those of another, eight of them showed a statistically significant difference.

The varying estimations of the number of " caries-free " children suggest that consider-

able error occurred over the simple and early lesions.

Clinical research concerning methods of caries prevention must use children for the clinical material, and since, in children, most of the lesions are simple pit and fissure lesions, great care must be taken in their diagnosis.

Deatherage *et al.* stated that dentists would probably disagree for about one-third of the time in diagnosing the condition of the same child, unless improvements were made in the technique of diagnosis.

In studying the diagnostic procedure of workers who do make some mention of their technique a variety of standards concerning the diagnosis of an early lesion will be noted. Staz (1938) makes an arbitrary division of pits : P0 is the symbol used to indicate ordinary shallow anatomical pits, P1 denotes a pit a shade deeper, P2 denotes a pit deeper still and P3 a definite cavity. Abrahams (1946) considers extremely deep pits to be pre-carious, but does not say whether such are included in his estimations. Day and Sedwick (1935) include softened, discoloured and defective pits and fissures. Mellanby and Coumoulous (1946) include suspected fissures. Knowles (1948) includes small enamel lesions detectable by a probe, and suspected fissures in molar teeth.

Black (Operative Dentistry, Vol. I) states :

"... the discovery of pit and fissure decay is usually a simple procedure. As the examination proceeds the surface of the teeth in each bicuspid-molar region should be dried with blasts of air in order that the best view may be had. An exploring tine with a small sharp pointed end should be used to test the positions of all pits even though they appear not to be decayed.

" The point should be applied with some pressure and if it enters the enamel a little so that a very slight pull is required to move it, the pit should be marked for restoration even though there is no sign of decay."

Black's suggested technique is the nearest approach made to standardisation, but it is considered that a greater precision of definition is necessary.

It will at once be realised that in order to compare the results of one worker with those of another there must be a sufficient degree of homogeneity as to preclude statistical variation. Otherwise comparisons are not possible.

It is a solid fact that observations of the same phenomenon even under identical conditions and with the same standard of measure, will vary and will never be absolute, so that we can never expect absolute homogeneity. There must be, however, a state of approximation which is sufficiently accurate for practical needs, and it is this state of approximation for which an attempt should be made.

Standard Procedure

For experimental purposes a standard procedure was defined as follows :

(1) Before examination, the teeth must be clean and free from extrinsic stains and food debris.

(2) The examination must be carried out in good lighting conditions.

(3) The examination must proceed in a routine order by commencing in the lower left region, progressing to the lower right, thence to the upper right and proceeding to the upper left.

(4) A clear mirror and sharp probes must be used for each examination. For the detection of pit and fissure lesions, Ash's Sickle Probe No. 54 is to be used, and for approximal lesions, Ash's Probe No. 12 is to be used.

(5) Each tooth must be dried thoroughly, and every surface be examined.

(6) Before each examination the sickle probe is to be sharpened lightly with a medium sand-paper disc to make a conical point.

(7) A pit or fissure is counted as carious if with a little pressure the point sticks *without doubt* and requires a definite pull for its removal. Anything which is at all doubtful is *not* included.

(8) Stained pits or fissures are not counted as carious unless they satisfy this test.

(9) The probe must be used in all fissures and pits in several angles.

(10) Approximal lesions are considered detectable if Ash's No. 12 probe catches a roughened surface or a definite cavity.

(11) Stained or opaque light areas on other smooth surfaces are not called carious unless there is positive and undoubted evidence of enamel dissolution.

(12) Arrested caries is counted as carious, and exposed dentine in hypoplastic teeth is counted as carious only if there is positive evidence of softening.

It is not considered that this technique is absolute, but when it was devised it was hoped that it would provide a sufficiently accurate procedure for any examiner to use, so that the results would yield a sufficient approximation for practical purposes.

The use of good lighting is an obvious requisite, although it is realised that when examinations are carried out " in the field," this is not always possible.

That the teeth should be dry and clean requires little argument. It is interesting to note that Sognnaes (1940) found that 20 per

cent of all recorded lesions (not teeth) are missed if the teeth are not cleaned and dried. These lesions he describes, to be of two types:

(1) Those in which decalcification has advanced far enough to cause a slight roughness of one surface.

(2) The second type is that in which opaque lifeless areas, spots or lines appear without roughness of the enamel.

This type he considers to be " . . . probably the very first clinically visible sign of tooth destruction, and since they offer themselves to possibilities of preventive treatment no dental record is complete unless it includes these overlooked manifestations."

The appearance of white opaque spots, areas and lines is well known to all clinicians, and they offer the special difficulty of classification. Whether they are areas of hypocalcification or of decalcification is extremely difficult to say. It is highly likely that many of these manifestations are in effect areas of hypocalcification, which can very easily become carious or even stained in the absence of caries.

Sognnaes quite rightly states that these manifestations offer possibilities of preventive treatment. That being so, it is not logical to include them in the caries score, although they should be clinically recorded. If any standardisation of clinical procedure is to be achieved, clinicians must agree on what they consider to be, without doubt, the first detectable sign of clinical caries.

Dental pathologists are agreed that the first external sign of caries on a smooth surface is a dull white area, but since this clinical manifestation is the same for hypocalcification without caries, then clinical differentiation is difficult if not impossible. It is considered, therefore, that the first clinical sign of caries on a smooth surface which can be clinically diagnosed without doubt is the positive softening and eroding of the enamel surface. The differentiation in certain instances between a roughened surface due to hypoplasia or fluorosis and that due to true caries is difficult to define by words and here reliance very largely depends on the clinical acumen of the examiners.

The exclusion of stained fissures and pits from the caries score, unless they satisfy the criterion as stated in item 7 of the proposed procedure, may give rise to certain criticisms. It is considered on purely clinical evidence that, whilst carious pits and fissures in the majority of cases do become stained, staining alone is an insufficient criterion. Pincus (1948) suggests that the initial lesion of caries in these sites, is the loss of the protein which normally fills all pits and fissures. When this has advanced to a certain stage of progression the fissure or pit will allow the entrance of a sharp probe which will stick and will require a slight but definite pull for its removal. It is considered that this is the first undoubted clinical manifestation of caries in these sites.

Variation in pressure when using the probe, is bound to occur, and must always remain a personal variation. Consideration of this problem resulted in the conclusion that a standard pressure could only be obtained if an instrument was devised which could be clamped on to the tooth, and could have attached a sharp point controlled by hydraulic pressure. This was not considered to be practicable, and the variation in pressure had to be accepted. If a sufficient approximation of diagnoses could be achieved without resort to a standard pressure, then the variation could be discounted.

The choice of Ash's Probe No. 54 to detect pit and fissure lesions was made because of the ease with which the point can be directed at any given angle. It was found, however, that the end of the probe soon blunted to an extent dependent on the number and hardness of teeth examined, and that it was advisable to sharpen the probe before each examination. Much consideration was given to the method of sharpening. To avoid softening of the metal, the probe should be sharpened on a stone, but owing to the angulation of the probe it is difficult to avoid making a wedge-shape point which is undesirable. The use of a medium sandpaper disc was found to be quite satisfactory in the production of a conical point.

To detect approximal cavities Ash's Probe No. 12 was deemed to be the most suitable. Its corkscrew end allows the point to be brought up to the approximal surface at right-angles, and any positive cavity can hence be easily detected. It was not considered necessary to sharpen this probe because its desired function to detect a roughened surface or definite cavity does not merit a point of considerable sharpness.

To determine the ability of the proposed standard procedure to approximate diagnoses three investigations were made.

In Investigation I, three examiners of presumably equal competence were asked to examine a group of children for dental caries. Fillings and extractions were also to be recorded. Examiner A used the standard procedure, but examiners B and C, who were not informed of the nature of the investigation, were left to examine by whatever procedure or standard they deemed necessary.

In Investigation II, another group of children

was examined. Examiner A still used the standard procedure, but examiners B and C were now asked to sharpen their probes lightly before each examination.

The standard procedure was used by all examiners in Investigation III.

Apart from the variances mentioned all examinations were carried out under identical conditions. The children were of a mixed age-group, viz. 10–14 years. This had no bearing on the investigation except that the children had early lesions, and that only permanent teeth were considered. The children were not the same for each investigation.

Examples of the results of the first examination are given in Table I. The total D.M.F. values found by each examiner A, B and C were 289, 276 and 220 respectively.

TABLE I.—THE D.M.F. OF CHILDREN AS FOUND BY THREE DIFFERENT EXAMINERS

Investigation I

Number of children examined	96
Total number of D.M.F. teeth :	
Examiner A...	289
Examiner B...	276
Examiner C...	220
Number of cases in which findings of all three examiners were identical	20*
Number of cases in which findings of any two of the three examiners were the same ...	55
Number of cases in which findings of all the examiners differed	21

*Four of these were children with no caries.

DETAILS OF THE D.M.F. OF THE FIRST 6 OF THE 96 CHILDREN EXAMINED FOR COMPARISON WITH THE HYPOTHETICAL GROUPS IN TABLE IV

Case No.	*Examiner*		
	A	*B*	*C*
1	4	3	2
2	1	1	0
3	0	1	0
4	2	2	2
5	7	4	4
6	10	10	7

In Investigation II (Table II) the total values were 196, 214 and 209 respectively. These figures for Investigation III (Table III) were 440, 450 and 459 respectively.

TABLE II.—THE D.M.F. OF CHILDREN AS FOUND BY THREE DIFFERENT EXAMINERS

Investigation II

Number of children examined	61
Total number of D.M.F. teeth :	
Examiner A...	196
Examiner B...	214
Examiner C...	209
Number of cases in which findings of all three examiners were identical	24*
Number of cases in which the findings of two of the three examiners were the same ...	31
Number of cases in which findings of all three examiners differed	6

*Six of these were children with no caries.

TABLE III.—THE D.M.F. OF CHILDREN AS FOUND BY THREE DIFFERENT EXAMINERS

Investigation III

Number of children examined	60
Total number of D.M.F. teeth :	
Examiner A...	440
Examiner B...	450
Examiner C...	459
Number of cases in which findings of all three examiners were identical	18*
Number of cases in which findings of any two of the three examiners agreed	32
Number of cases in which findings of all three examiners differed	10

*One child had no caries.

There is a much better approximation of total values in Investigations II and III, but to determine the approximation in individual cases it is necessary to subject the results to an analysis of variance, a statistical procedure used to determine the degree of homogeneity. Details of the analyses are given in the statistical appendix. The results of these analyses show that the variances between examiners for each case are significantly high in Investigation I. They are less, but still significant in Investigation II. In Investigation III these variances are small, and not of significance.

STATISTICAL APPENDIX

Analysis of Variance

1st Examination

Source of variation	*Sum of squares*	*Degrees of freedom*	*Estimate of variation*
Examiners ..	26·36	2	13·18
Children ..	1283·50	95	13·5
Residual ..	123·90	190	0·65
Total	1433·76	287	

$$Z = \tfrac{1}{2}(\log_e 13{\cdot}18 - \log_e 0{\cdot}65)$$
$$= 1{\cdot}1513 \log_{10} 20{\cdot}3$$
$$= 1{\cdot}1513\ (1{\cdot}307)$$
$$= 1{\cdot}50$$

For $n_1 = 2\ n_2 = 190$, the 0·1 per cent of distribution of Z is about 1·0. The difference is highly significant and the hypothesis of homogeneity of examiners has not been proved.

Analysis of Variance

2nd Examination

Source of variation	*Sum of squares*	*Degrees of freedom*	*Estimate of variation*
Examiners ..	2·83	2	1·415
Children ..	1333·22	60	22·22
Residual ..	29·17	120	0·243
Total	1365·22	182	

$$Z = \tfrac{1}{2}(\log_e 1{\cdot}415 - \log_e 0{\cdot}243)$$
$$= 1{\cdot}1513 \log_{10} 5{\cdot}82$$
$$= 1{\cdot}1513\ (0{\cdot}765)$$
$$= 0{\cdot}88$$

For $n_1 = 2$ and $n_2 = 120$, the 1 per cent point of Z-distribution is about 0·80. Therefore, the difference is significant (but less so than for the 1st examination). Again the hypothesis of homogeneity of examiners has not been proved.

ANALYSIS OF THE VARIANCE

3rd Examination

Source of variation	*Sum of squares*	*Degrees of freedom*	*Estimate of variation*
Examiners ..	3·27	2	1·635
Children ..	2633·61	59	44·64
Residual ..	88·06	118	0·7462
Total	2724·94	179	

$$Z = \tfrac{1}{2}(\log_e 1{\cdot}635 - \log_e {\cdot}7462)$$
$$= 1{\cdot}1513 \log_{10} (2{\cdot}191)$$
$$= 1{\cdot}1513\ (0{\cdot}3406)$$
$$= 0{\cdot}3921$$

For $n_1 = 2$ and $n_2 = 118$, the value is not significant and the hypothesis of homogeneity has not been disproved.

From the results of this investigation arose the question of whether, in spite of an accepted variance of examiners, an equal dispersion of these examiners in control and experimental groups would lead to any significant difference.

To determine the answer to this question it was decided to take the results of Investigation I, and make three hypothetical groups X, Y, Z in which the findings of the three examiners were uniformly dispersed, but in random fashion. This was done by writing down on six small cards, equal in size, all the possible combinations of three of the letters, A, B, C which correspond to the examiners. These were ABC, ACB, BCA, BAC, CAB and CBA. The cards were then shuffled and the combinations noted as they were dealt. Thus, in groups of six, a random order was obtained. For the first group of six, the combinations obtained were in the order BAC, CAB, ABC, ACB, BCA and CBA. In Case number 1, the findings of examiner B in Table I were put into the hypothetical group X, those of examiner A into group Y, and the findings of examiner C into group Z. In Case number 2, the findings of C were put into group X, those of A into group Y, and those of B into Group Z. By continuing this procedure, three hypothetical groups were obtained which had identical caries attack rates : this was so because the children examined were the same in each group. There was also an equal dispersion of examiners known to have a high variance in their findings. If three different groups of 96 children had been examined and each examiner had examined 32 in each group, the desired information would not have been obtainable since the absolute true caries attack rate of each group would have remained unknown, and any difference in the groups could possibly have been due to an actual and true variance of the groups themselves. By this mathematical creation of three hypothetical groups, three identical groups are obtained, and any variance will be due to inconsistency of the examiners.

An example of the results of this dispersion is given in Table IV.

TABLE IV.—EXAMPLE TO SHOW THE METHOD ADOPTED OF REDISTRIBUTING THE FINDINGS IN RESPECT OF THE 96 CHILDREN EXAMINED IN INVESTIGATION I TO FIND THE D.M.F. OF THREE HYPOTHETICAL GROUPS OF CHILDREN (compare Table I)

Case No.	*Examiner*		
	X	*Y*	*Z*
1 ...	B 3	A 4	C 2
2 ...	C 0	A 1	B 1
3 ...	A 0	B 1	C 0
4 ...	A 2	C 2	B 2
5 ...	B 4	C 4	A 7
6 ...	C 7	B 10	A 10

An analysis of variance is not necessary on the figures so obtained since the test for homogeneity is not desired. The information desired is whether group X has a significantly different caries attack rate from that of group Y or Z, although it is known that if there was an absolutely precise method of measurement they would be identical.

This information can be given by the ordinary test of significance, the difference between any of the two groups being significant if the differences between the two means are twice or greater than the value of the standard error of the difference.

Subjecting the figures to this test, the results are as follows :

$X = 250$	$\overline{X} = 2{\cdot}603$	$\Sigma X^2 = 1078$
$Y = 267$	$\overline{Y} = 2{\cdot}781$	$\Sigma Y^2 = 1219$
$Z = 268$	$\overline{Z} = 2{\cdot}792$	$\Sigma Z^2 = 1284$

The standard deviations are found by the general formula

$$S.D. = \sqrt{\frac{\Sigma X^2}{N} - \overline{X}^2}$$

S.D.X = 4·454 S.D.Y = 4·966 S.D.Z = 5·585

From the general formula

$$SE = \sqrt{\frac{(S.D.X)^2}{N} + \frac{(S.D.Y)^2}{N}}$$

the standard error between group X and group Y is found to be ·3132, between X and Z to be ·3232, and between Y and Z to be ·3315.

Hence in comparing any of the two groups we have :

(1) X and Y	$\overline{X} = 2{\cdot}603$ $\overline{Y} = 2{\cdot}781$	Diff. = 0·178 SE. = 0·3132
(2) X and Z	$\overline{X} = 2{\cdot}603$ $\overline{Z} = 2{\cdot}709$	Diff. = 0·106 SE. = 0·3232
(3) Y and Z	$\overline{Y} = 2{\cdot}781$ $\overline{Z} = 2{\cdot}792$	Diff. = 0·011 SE. = 0·3315

In no instance is the difference between the two means twice or more than the standard error of the difference, and consequently there is no statistically significant difference between any of the two groups. It may be concluded that the examiners, although examining by variant standards, examined consistently, and the equal dispersion cancelled out the variance. Further, if examiners examine consistently, although by slightly different standards, it is permissible for several examiners to be used in experimental work if they are equally dispersed in experimental and control groups. This is important, because in certain instances it is not possible for one examiner to examine all the cases. It is, of course, desirable that a standard procedure be used in all cases, and that only one examiner be used in experimental work when this is possible.

Discussion and Conclusions

The laboratory methods of measuring caries susceptibility are considered to be insufficiently precise for experimental work. On the other hand the clinical diagnosis of caries can only give a relative assessment of caries susceptibility and even if radiographs are used, the absolute and true value cannot be obtained.

Burket (1941) by using clinical, radiographic and microscopic methods of diagnosis claimed that of all the lesions (not teeth) obtained by the combined method, 24 per cent could be detected by microscopic study only.

In a general sense, measurement can never be absolute, and accuracy for practical needs is all that is necessary. A combination of clinical and radiographic methods is the maximum one can do to diagnose caries, but in two analogous groups the clinical method alone is sufficient to provide a relative assessment of caries susceptibility.

Cheyne and Horne (1948) state that "... if the (*clinical*) examination is used as a basis for evaluation the caries picture between groups of children used for experimental studies, the roentgenograph is of such little value in changing the score that it may be considered dispensable." Although this conclusion is based on a surface index the difference would be smaller and even of less significance if the D.M.F. index was used, for reasons mentioned previously.

The clinical method, is then the most useful method of diagnosing caries.

In the absence of any well-defined diagnostic procedure, examiners vary in their findings to an extent which could significantly alter the nature of the results. This has been noted by Deatherage (1939) Ast (1943) and Gythfeldt (1938).

It has been shown that a well-defined standard of diagnostic procedure can so approximate the findings of examiners that the variances which do occur are of no significance. The procedure was devised for closely controlled experimental work. In the field it is recognised that precleaning of the teeth is not always possible, and that lighting is not always good but, apart from these features, it is suggested that the rest of the proposed procedure is quite applicable for field surveys.

It is quite possible that there will be certain criticism of the suggested procedure, but for true and fair comparisons between the results of one worker and those of another, clinicians must eventually agree on a technique which will produce a minimal of variance.

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XYLOCAINE: A CLINICAL REPORT

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From time to time new local anæsthetic drugs are introduced to the dental profession, but, until recently, most of them have been variations of formulæ containing procaine as the anæsthetic agent together with adrenaline hydrochloride as a vasoconstrictor.

The shortcomings of this combination of drugs are well known, e.g. the toxic effects on some patients and the occasional inexplicable failure to produce anæsthesia of the dental tissues. Used without adrenaline, procaine exhibits little effective anæsthetic power, and even when combined with adrenaline or cobefrin, the depth and duration of anæsthesia often leave much to be desired.

Dermatitis may attend the use of procaine and it has no place in dental surgery as a surface anæsthetic.

The introduction of an entirely different local anæsthetic drug is, therefore, of prime importance to general and dental surgery.

The history of xylocaine dates back to 1935 when Erdtman and Löfgren [1] noticed the anæsthetic effect of an isomer of gramine upon the tongue. They investigated a group of anilides and in 1946, Löfgren and Lundquist [2] reported the synthesis of a substance, w-diethylamino-2, 6-dimethyl-acetanilide, which they called xylocaine. This substance is not related to cocaine nor its substitute procaine, nor to other local anæsthetic drugs such as nupercaine and tropacocaine, and may truly be described as a " new " local anæsthetic.

Early investigations on the pharmacological and other properties were carried out in Sweden ; more recent literature comes from America.

Goldberg [3–6] carried out pharmacological investigations (with reference to laboratory animals), and his findings indicated the following important points :

(*a*) Xylocaine, pH3, is less irritating than procaine, pH3, when injected into the tissues.

(*b*) When applied to the conjunctival sac in concentrations up to 8 per cent, it caused no irritation.

(*c*) It is an efficient surface anæsthetic.

(*d*) It is stable and does not decompose when boiled.

(*e*) It has a security coefficient 2–4 times higher than procaine.

(*f*) The anæsthetic effect exceeds that of procaine.

(*g*) It may be used with or without adrenaline.

Gordh [7] studied the new drug in the surgical clinic of the Karolinska Hospital, Stockholm, with special reference to wheal tests, infiltration anæsthesia for major and minor surgery, conduction anæsthesia, surface anæsthesia, and in the treatment of painful conditions.

A point which will interest dental surgeons is his comment that " the preparation seems to have a marked affinity for the sensory nerve fibres."

Bremer *et al.* [8] reported on the use of xylocaine in dentistry over a period of two to three years. They summarise their findings as follows :

(1) The anæsthetising effect of xylocaine clearly excels that of novocain. This was especially evident in cases in which it was difficult to produce anæsthesia.

(2) The time required for the agent to take effect is considerably less than the time required with novocain, as may be easily observed clinically.

(3) The duration of anæsthesia may be varied within wide limits.

(4) Local and general side actions are extremely rare.

(5) In contradistinction to novocain, xylocaine takes anæsthetic effect without addition of epinephrine.

(6) Xylocaine is easily tolerated even by sensitive patients.

(7) It is a good surface anæsthetic.

Björn and Huldt [9] investigated the effectiveness of xylocaine by measuring tooth response to graded electrical stimulation. Utilising the four efficiency parameters adopted by Björn [10], viz. the frequency, extent, duration and latency of anæsthesia, they found that, in comparison with procaine, xylocaine showed the following advantages :

(1) The anæsthesia was more profound.
(2) The onset of anæsthesia was more rapid.
(3) The spread of anæsthesia was more extensive.
(4) The duration of anæsthesia was longer.

Lazansky and Robinson [11] have since corroborated these findings.

Lozier [12] reported on 1,950 cases where xylocaine was employed, and his clinical results bear out the favourable findings of other workers. He mentions the use of this agent in patients with such conditions as nephritis, extreme hypertension and various types of

cardiac disease "without ever encountering any apparent side reactions attributable to this anæsthetic agent *per se*."

These consistently good reports by pharmacological and clinical experts seem to indicate that a valuable addition has been made to the range of local anæsthetic drugs. Xylocaine will soon become available to the dental profession in this country, and it is highly probable that its use will become general in dental surgery.

Clinical Trials

Our experience is confined to the use of various xylocaine preparations over a period of seven months in the Conservation Department of the Edinburgh Dental Hospital. During this period the drug was used on most patients requiring local anæsthesia for different types of dental operations. A certain number (250) of the injections were recorded in detail, and, in particular, the effects of the drug on patients who had reacted unfavourably to procaine-adrenaline solutions, or who had experienced failures to produce anæsthesia with such solutions, were noted. In the main, the conclusions set out in this report are based on clinical assessment of the use of xylocaine in routine dental procedures. In such a study the observer's clinical judgment is a major variable, and must be taken into account in the evaluation of results.

Solutions.—The following solutions were supplied for clinical trial[1]:

2 per cent xylocaine.

2 per cent xylocaine-adrenaline 1 : 50,000, "Special."

2 per cent xylocaine-adrenaline 1 : 80,000.

1 per cent xylocaine-adrenaline 1 : 100,000.

The solutions contain an antiseptic and are isotonic. The pH of xylocaine is 6·9, but when combined with adrenaline the solution has a pH of 3·5–4·0.

The solutions were supplied in 20 c.c. serum-type, rubber-stoppered bottles with aluminium tear-off seal and aluminium cap. Before use, the rubber stopper was sterilised with absolute alcohol.

The preference of many practitioners for cartridge preparations has been acknowledged by the manufacturers in this country and we understand that xylocaine will become available in this form at a later date.

In the trials carried out, xylocaine was used in the following types of dental operations: Pulp extirpation. Jacket and three-quarter crown preparations. Extraction of teeth. Preparation of sensitive cavities. Removal of buried roots. Apicectomy. Surgical treatment of dental cysts. Alveolectomy. Removal of calculus from salivary duct. Gingivectomy.

The data recorded included:

(1) Type of injection.

(2) Type of solution used.

(3) Amount (in minims) of solution injected.

(4) Type of operation.

(5) Time of onset of anæsthesia (calculated from time of withdrawal of needle to time of onset of effective anæsthesia).

(6) Duration of anæsthesia. Patients were asked to note the time of disappearance of all signs of anæsthesia.

(7) Degree of anæsthesia. This was assessed from the reaction of the patient to the operation. The following notation was used: x slight diminution of normal sensitivity. xx "working anæsthesia"; occasional slight reaction to the stimulus of operation. xxx complete anæsthesia.

This cannot be regarded as a critical evaluation of the depth of anæsthesia, but it is possible that some degree of uniformity, from the clinical standpoint, was achieved.

(8) Side-effects during injection.

(9) After-effects.

The following observations are based on analysis of the 250 recorded injections, together with clinical impressions formed during the general use of xylocaine over the trial period.

2 *per cent Xylocaine-Adrenaline* 1 : 80,000.

Onset of Anæsthesia.—An effective anæsthesia was rapidly obtained with both infiltration and conduction injections. With infiltration in the maxilla, two to three minutes was the average time of onset of effective anæsthesia, but in many cases less than two minutes elapsed before operating was possible. In this instance it is interesting to mention an observation by Bremer that "the new agent has a great capacity for rapidly penetrating the jawbone."

In the mandible, infiltration of the anterior teeth is frequently effective, but this type of injection was not attempted in the molar and premolar regions.

When used for conduction anæsthesia, the rapidity of onset was again apparent. Immediate production of profound anæsthesia was not uncommon, and in many instances the patient volunteered the information that the lip began to tingle before the needle was withdrawn.

With inferior dental and mental injections three to five minutes was the average time of onset of effective anæsthesia.

The posterior superior dental injection became effective in a shorter time, viz. one to two minutes.

[1] Supplied by Messrs. Duncan, Flockhart and Co., Edinburgh.

Local Effects During Injection.—No unpleasant local effects were observed during or immediately after any injection.

General Effects During Injection.—Freedom from side-effects during and after injection is one of the most striking advantages of xylocaine over procaine. Every dentist is familiar with the various degrees of toxic reaction which may attend the injection of procaine-adrenaline solutions, ranging from slight palpitation to syncope. The adrenaline content of the solution is, of course, an important factor with such patients, but it is worthy of note that when 2 per cent xylocaine-adrenaline solution was used on patients who had previously experienced unpleasant side-effects from the use of procaine-adrenaline, toxic effects were diminished or were entirely absent. The good results obtained in this connection were frequently a matter for comment on the part of the patient.

Depth of Anæsthesia.—This is difficult, if not impossible, to assess with any degree of accuracy. Some dental surgeons hold the view that a tooth is either anæsthetic or it is not. However, degrees of anæsthesia are familiar to most operators, and a state of diminished sensitivity which permits of operating with little discomfort to the patient not uncommonly attends the use of procaine-adrenaline solutions.

Our clinical observations support the conclusions of previous writers in that complete anæsthesia is almost the rule when 2 per cent xylocaine-adrenaline 1 : 80,000 is injected, and the occasional failure can be proved to be due to faulty technique by the successful use of the drug at a subsequent visit. Bremer states " the anæsthetising effect of xylocaine clearly excels that of novocain," and we have formed an impression that this may be true. We are convinced that consistently good results attend its use, and these have been particularly noticeable with patients who are known to be difficult to anæsthetise with procaine.

Extent of Anæsthesia.—When injected locally, comparatively large areas are involved by the anæsthetic action of the drug. For example, submucous injection in the upper premolar region often results in anæsthesia of the molars and canines. This is not necessarily a desirable end if operating is to be confined to one tooth. It does, however, seem to indicate a peculiar property of the drug, viz. a marked penetrating effect, previously referred to in this paper. Such a property is obviously of great value in oral surgery, e.g. in root resections and the curettage of cysts.

Duration of Anæsthesia.—This is dependent on several factors, not the least important of which are the adrenaline content of the solution and the amount of solution injected. Questioning of the patient reveals the time of disappearance of anæsthesia of the mucosa, but the dental surgeon is more concerned with the duration of anæsthesia effective for operating purposes.

Table I indicates the amounts of 2 per cent xylocaine-adrenaline 1 : 80,000 which have been found to be adequate for various dental operations on adult patients. Adjustments should be made for extremes of age.

TABLE I

Injection	*Total amount of drug injected*	*Operation*	*Approx. duration of effective anæsthesia*	*Disappearance of all signs of anæsthesia*
Submucous infiltration maxillary teeth (except molars)	15 minims	Pulp extirpation	30 minutes	1½–2 hours
	25 minims	Cavity preparation. Extraction	1 hour	2–4 hours
	30–35 minims	Jacket or ¾-crown preparation. Apicectomy	1¼–1½ hours	2–4 hours
Postr. supr. dental block	25 minims	Operations on upper molars	1 hour	
Mental block	25 minims	Operations on lower canines and premolars	¾–1 hour	2–4 hours
Inferior dental block	25 minims	Operations on lower teeth	1 hour	2–4 hours

Maximum Dose.—Gordh states that 0·5 to 1·0 grm. is the maximal dose to be used. In dentistry it should not be necessary to approach this maximum, but if it is reached, a further injection should not be given during the same day.

Symptoms of overdose are said to vary from nausea to unconsciousness and convulsions. We have had no experience of overdosage.

After-effects.—During the seven months' trial period, unpleasant after-effects were practically unknown. Two patients complained of slight nausea during anæsthesia, and one patient had a post-operative hæmorrhage after the extraction of a molar tooth. This patient was a known " bleeder."

Pain and swelling occurred in 3 patients following root resections, but in view of the nature of the operation, it was not considered that xylocaine was wholly responsible for these untoward effects.

The use of a careful technique with any local anæsthetic drug minimises the possibility of unpleasant after-effects. Strict observance of

the principles of asepsis, slow injection, and the avoidance of injecting into infected areas are essential if after-pain, swelling and serious surgical complications are to be prevented.

It is interesting to note that, at a point near the end of the anæsthetic state, return to normal sensation appears to be rapid.

Patients repeatedly volunteered the information that anæsthesia disappeared quickly, often within ten to fifteen minutes.

2 *per cent Xylocaine–Adrenaline* 1 : 50,000 "*Special*"

This solution has been produced for patients who are difficult to anæsthetise and for surgical operations requiring prolonged anæsthesia. The increased adrenaline content aids in keeping the field of operation free from blood.

As only a small amount of this solution was supplied, we have not yet had sufficient experience of its use to assess its value in oral surgery. The 2 per cent xylocaine-adrenaline 1 : 80,000 solution appears to fulfil most requirements in conservation work and minor oral surgery, though it is conceivable that a higher adrenaline concentration might be useful for prolonged operations.

An increased risk of toxic reactions in adrenaline-susceptible patients would be expected when using the "Special" solution.

2 *per cent Xylocaine*

This may be employed when a patient is known to react to solutions containing adrenaline, or where there is a possibility of adverse effects due to the existence of such conditions as diabetes, thyrotoxicosis or arteriosclerosis.

Anæsthesia may be described as transient but may be adequate for the extraction of a tooth or the extirpation of a pulp. Absorption of this solution is more rapid than that of solutions containing adrenaline, and thus the smallest dose commensurate with effective anæsthesia should be used.

1 *per cent Xylocaine–Adrenaline* 1 : 100,000

This solution is less effective in both depth and duration of anæsthesia than 2 per cent xylocaine-adrenaline 1 : 80,000. It is possible that the low adrenaline content may indicate its use in patients who are susceptible to adrenaline, but we have not had occasion to use it in this connection.

Case Reports

Case 18.—Professor A. B. Inferior dental injection given at 3.35 p.m. for cavity preparation of $\underline{|6}$. 20 minims of 2 per cent xylocaine-adrenaline 1 : 80,000 injected. Left lower lip commenced to tingle before the needle was withdrawn. Cavity preparation commenced immediately, anæsthesia being profound. At 7.30 p.m. return to normal sensation commenced, and this was complete at 8 p.m. The patient described the anæsthesia as the "most profound dental anæsthesia I have experienced."

Case 112.—Dr. G. Tuberculous patient. Her medical colleagues were unwilling to administer a general anæsthetic for the extraction of 14 teeth. The patient gave a history of distressing systemic effects attending the previous injection of procaine-adrenaline solutions.

2 per cent xylocaine-adrenaline 1 : 80,000 was injected on 5 occasions for the extractions, and apart from a slight tachycardia during the injections, no unpleasant effects were exhibited.

Case 74.—Mr. J. M. Local infiltrations with 2 per cent procaine preparations by three operators failed to produce anæsthesia of $\underline{1|}$ for jacket crown. preparation.

30 minims of 2 per cent xylocaine-adrenaline 1 : 80,000 produced profound anæsthesia one minute after withdrawal of the needle. The tooth was prepared painlessly over a period of one and a half hours.

Case 107.—Mr. A. K. A carious cavity in $\underline{|8}$ was exquisitely sensitive to the touch of a probe. A posterior superior dental injection of 25 minims 1 per cent xylocaine-adrenaline 1 : 100,000 was given, and the cavity touched repeatedly until anæsthesia supervened. Probing caused no pain after sixty seconds, and after 120 seconds painless drilling was commenced.

Case 134.—Mr. J. W. Acute pulpitis $\underline{|5}$. 25 minims of 2 per cent xylocaine-adrenaline 1 : 80,000 were injected locally. In thirty seconds the pain had completely disappeared, and at the end of three minutes the tooth was extracted without pain.

Surface Anæsthetic Effect of 2 per cent Xylocaine–Adrenaline 1 : 80,000

The surface anæsthetic effect of this solution was tested on a second series of 50 patients.

The following procedure was adopted :

The mucous membrane of the labial sulcus in the region of the right upper lateral incisor was dried, and the solution applied on a small pledget of wool. The pledget was held firmly against the mucosa for one minute. At the end of this time, a 25 gauge dental hypodermic needle was inserted through the mucosa. The patient's reaction was noted and if pain was experienced, the same procedure was repeated in the upper left lateral incisor region. At the end of two minutes the mucosa was again tested and, if still sensitive, the anæsthetic was applied in another region, for three minutes.

Results.—5 patients experienced surface anæsthesia within one minute, 40 within two minutes, 5 within three minutes.

Comment.—The solution is an effective surface anæsthetic, but the waiting period before surface anæsthesia is produced is a disadvantage. Some of the patients complained of the bitter taste, although others were unable to detect anything unpleasant in this respect. No patient exhibited any after-effects.

Summary

Clinical experience of the use of xylocaine over a period of seven months is described.

Conclusions

(1) 2 per cent xylocaine-adrenaline 1 : 80,000 is an efficient local anæsthetic agent for use in dental and minor oral surgery.

(2) Onset of anæsthesia after injection of xylocaine is rapid.

(3) Using the stated dosage (Table I), side-effects and after-effects are extremely rare.

(4) Application of 2 per cent xylocaine-adrenaline 1 : 80,000 to the oral mucosa produces surface anæsthesia.

Acknowledgments

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Practical Note

INDUSTRIAL ELECTRIC MOTORS SUITABLE FOR DENTAL PURPOSES

By ROBERT CUTLER, L.R.C.P.Lond., M.R.C.S., L.D.S.Eng.

To the dental practitioner reluctant to pay the comparatively high prices now charged for first-class multi-speed dental motor lathes, the wide range of single-speed engineer's motors of excellent quality form a tempting alternative, as chuck or polishing spindle attachments can be fitted without much difficulty, and it is the purpose of this note to indicate which types are suitable, so that specific enquiries can be made of manufacturers, or the usual engineer's tool factors.

In general, multi-speed arrangements are not essential, and add greatly to the cost, since multiple windings have to be incorporated, with appropriate switchgear, if power is to remain constant at any given speed. For all dental purposes, whether heavy polishing with the standard lathe brush, or portable dental-engine work, a single speed of 2,800 r.p.m. is entirely adequate, speeds below 1,500 r.p.m. being quite unsuitable, and this eliminates the largest class of industrial fractional horse-power motors whose standard speed for engineering work is almost invariably 1,425 r.p.m. Another class of industrial motor to be avoided are series wound universal types, as these are designed for working under constant load, i.e. a fan or heavy balanced grinding wheels, and if used otherwise the speed varies in a manner quite unsuited for delicate work. On specific request, however, suitable types can be obtained with no material delay at a basic price of less than £8, the necessary attachments adding little to the cost.

Motors for Heavy Work

For heavy polishing work a totally or partially enclosed motor of $\frac{1}{6}$ or $\frac{1}{4}$ horse-power is advised with rated constant "no load" speed of 2,800 r.p.m., sleeve or ball bearings are usually optional, the shaft diameter being $\frac{1}{2}$ or $\frac{5}{8}$ inch ; a single end shaft is usual, and this is a disadvantage, though double ended shafts are obtainable in some makes. All such motors are for 200–250 volt A.C. 50 cycle supply and are of induction type, this rendering them entirely trouble free, as brushes or commutators are eliminated. Instructions for reversing direction of rotation are supplied, but this is only relevant if a single end shaft motor has to be used in any particular position, as, if not, the whole motor is just turned round ; direction of rotation for grinding and polishing is of course towards the operator in every case. These motors may be classified as "split phase" or "capacitor start" but this is of no significance for dental purposes as it simply refers to the self-starting characteristic under load ; "capacitor start" varieties usually have the condenser fixed as an integral part of the motor, this in no way adds to the complication of fitting up. All such motors are constant speed, i.e. they run at the rated r.p.m. from the moment of switching on, and if too great a load is applied the motor simply stops, so that if a motor of adequate power is specified, speed and torque is constant at all times.

Motors for Light Work

For light polishing or grinding at the bench, i.e. the "fettling" of dentures with the small grinding wheel, as distinct from old-fashioned hand filing,

much smaller motors are desirable, 1/30 or 1/20 horse-power capacitor types being ideal. These motors usually have doubled-ended shafts of $\frac{1}{8}$ or $\frac{3}{8}$ inch diameter, the appropriate chuck or wheel adaptors being available. These smaller constant speed motors form an ideal basis for a portable dental engine for nursing home or domiciliary operative work, though the fitting of a standard flexible dental shaft calls for some engineering skill and could not normally be undertaken by the practitioner himself. In passing it might be added that most of the portable engine kits marketed are hopelessly underpowered, and any effort made to secure proper motorisation of such units repays any work or expenditure involved. For bench work, a height of four inches from shaft to bench level is correct, with an adaptor length of three inches from the side face of the motor, this allowing a comfortable stance for the hands holding the denture to be fettled. All the motors indicated above are sufficiently heavy to need no screwing down to the bench and if the underside of the motor base board is lined with sponge rubber, $\frac{1}{4}$ inch thick, noise and vibration are minimal. It is a definite convenience to be able to move the smaller motors about on the bench to secure the most comfortable grinding position for denture fettling and the sponge rubber baseboard lining provides sufficient adhesion in any given position. All the motors described are what is known as "direct on line start," a simple five amp. household switch being entirely adequate, whilst a three wire connecting cable should be used to allow the motor casing to be earthed in the interests of safety. It might be interesting to record that of the ten motors in use in the author's laboratory, eight are of the patterns described above, all of which have been in continuous daily use for over five years without maintenance attention of any kind whatever. A list is appended of manufacturers to whom application can be made by those interested in this matter.

Hoover Motors, Perivale, Middx.

Metropolitan Vickers, Trafford Park, Manchester, 17.

B.T.H. Motors, Fractional Horse Power Division, Rugby.

Brook Motors, Empress Works, Huddersfield.

Fractional Horse Power Motors Ltd., Rookery Way, Hendon, N.W.9 (specialists in the smaller double end shaft motors).

Orthodontic Note

Pedodontic and Orthodontic Instruction: Combination, Separation or Integration

MANY believe that orthodontics should be given a more prominent position in undergraduate instruction. It correlates with the various subjects of the dental curriculum more than any other and helps to establish in the student's mind a concept of the normal as regards form and function, the foundation of both diagnosis and dental service. There may be differences of opinion about the advisability of treatment of malocclusion by general practitioners but it should be conceded that adequate training in the fundamentals of orthodontics is as important as for any other subject. It is usually pointed out when additional orthodontics is suggested that sufficient time cannot be provided in the undergraduate course. When first introduced at Iowa College of Dentistry, Children's Dentistry appeared to be an attempt to render better operative dentistry for the child so that the student should be able to appreciate the therapeutic value of operative service in preserving the health and function of the teeth and to render proper dental service to children by operative means. As yet, this is confined to a presentation of material by lectures and discussion rather than as applied clinical practice. As a result the orthodontic members of the staff find that, if they do not assume the instruction of the student in the fundamentals of orthodontics, some of those engaged in the teaching of pedodontics will, and in that case the teacher must be well grounded in the fundamentals of orthodontics. The object of the undergraduate course in orthodontics is to enable the student to appreciate its value in preserving the health and function of children's teeth and facial harmony. This is a big order as it is agreed among orthodontists that the guiding of the dento-facial structure involves much more fundamental knowledge, judgment and ability than are required to diagnose and even treat a recognised deformity. General health may have a harmful effect upon dental and other oral structures and conversely dental health plays an important role in the health, appearance, and mental attitude of the child. Hence over-specialisation at the undergraduate level should not be permitted to become detrimental to the student's understanding of general dental health. Numerous reasons have been advanced in support of the separation of orthodontics and pedodontics, though a few recommend their combination. Preventive dentistry should include all branches of dentistry for children, at least in teaching. If a combination of instruction is accepted, the staff of the two departments should plan what subjects are to be presented and by whom ; nutrition, child psychology and management, and the etiology of caries, together with its prevention and elimination, can be the responsibility of the pedodontic staff. The orthodontic staff would teach growth, etiology and diagnosis of dento-facial deformity, also its prevention. If a particular staff member in either department is an outstanding lecturer and well-versed in the entire field of children's dentistry, it might well be that all the theoretical subjects could be his responsibility. Such a combination course is for the presentation of fundamentals at undergraduate level. This article contains numerous quotations, some from " A Course of Study in Dentistry, American Association of Dental Schools," and from " Dental Education in the United States " by O'Rourke and Minor.—HIGLEY, H. B. (1949), *J. dent. Educ.*, **13**, 168.

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THE REPORT OF THE CHIEF MEDICAL OFFICER

THE Report of the chief Medical Officer to the Ministry of Health for the year ended December 31, 1948,[1] shows that the death-rate for the year was the lowest ever recorded in this country; a particularly encouraging figure being the reduction of the infant mortality rate to the low record figure of 34 per 1,000 live births, which represents a reduction of 78 per cent from the corresponding figure 50 years ago. The period of Sir Wilson Jameson's term of office as Chief Medical Officer has been a particularly strenuous one, covering, as it did, the years of the war and the preparations for, and launching of, the National Health Service, and it must be especially gratifying to him to be able to record such satisfactory results in his final Annual Report on the state of the Public Health. Sir Wilson Jameson's Report forms the first section of Part 1 of the Report of the Ministry, and there is an inevitable degree of overlapping between it and other sections of the Report dealing with administration, particularly those which deal with the administrative problems consequent upon the inauguration of the National Health Service.

The story unfolded in the dental sections of the Report is the now familiar one of an unexpectedly high demand rate, an overstrained profession and the partial disintegration of the priority services. There is an ironical ring about the statement "of even greater importance to the future dental welfare of the nation, was the coming into operation of the statutory duty placed on local authorities to provide for the dental care of expectant and nursing mothers and young children." There is, however, throughout, frank recognition of the unfortunate repercussions on the priority services of the offer of free comprehensive treatment to all and sundry, "the drift of dentists away from the public dental services for children and expectant and nursing mothers" being regarded as "the most serious feature of the dental service." It is, perhaps, not to be expected that the Report should contain proposals for bringing about an improvement in this admittedly disastrous position. The need is recognised, and there is an admirable section dealing with the inadequacy of the existing provision for dental treatment in hospitals of all kinds, but there is scarcely a hint as to how the competing claims of the different branches of the dental health service are to be reconciled, or how the limited resources of the profession can best be utilised to procure the greatest good for the nation as a whole.

With the comprehensive health service in being, however, the solution of these problems lies more in the political rather than in the administrative sphere, and it is, maybe, a little ungracious to complain that a Report, in which the ugly facts of the present position are objectively set out, does not contain proposals for dealing with the situation which has arisen. A situation which the Report says "imposed an undue strain on the physical resources of the dental profession, the staff of the (Dental Estimates) Board and the Dental Officer Service (of the Ministry)." Inevitably, the question must be asked, is the profession to be condemned for an indefinite time to continue operating a scheme which offers little or no hope of effecting any appreciable reduction in the incidence of dental disease or is it not possible, even at this late hour, to devise an alternative scheme which will place proper emphasis on early preventive treatment and put first things first?

The Ministry of Health have, of course, no direct responsibility for the school dental service, but reference is made in the Report to the steps which were taken prior to July 5, 1948, to impress on local authorities the importance of making adequate provision for the dental treatment in connection with their Maternity and Child Welfare Services. It is recorded that dental officers welcomed the opportunity to lay a sound foundation of dental health for the future adult population, and local authorities, we are told, were for the most part anxious to provide such a service. The outcome is now only too well known. Since the majority of the dentists engaged in M. & C.W. work were school dental officers who devoted part of their time to it, the service, which, taken as a whole, was already woefully understaffed, instead of being expanded as had been planned, suffered the same fate as the school service.

[1] Report of the Ministry of Health for the year ended March 31, 1949 (Cmd. 7910). His Majesty's Stationery Office. 7s. 6d. net.

And so the two services which, to quote the Report, " lie at the very foundation of a long term comprehensive scheme," are in a worse state than they were before the National Health Services were introduced. Whether the ground which has been lost can be regained to some extent by the voluntary efforts of individual private practitioners, following the lead given by the Council of the Association, remains to be seen. It is, however, clear that no scheme which does not provide for regular inspection of the whole school population, can provide an adequate basis on which to build a satisfactory dental service for the nation. In this connection, it is noteworthy that a paragraph in the Report is devoted to the dental service provided by the municipal authorities in Oslo and Bergen. It is a requirement under the schemes in operation in these two cities that those participating in them shall be examined at least once a year. Those failing to observe this rule are excluded from further benefit until they have had their teeth put in order at their own or their parents' expense.

The moral seems obvious, and the question it poses is, ought we not frankly to recognise that our attempts to provide complete treatment for everybody has led to a wasteful dissipation of the limited resources at our command, and modify our plans accordingly ?

NOTES AND COMMENTS

The Latest Cut in the Scale

As is indicated in the letters from the Ministry of Health, reprinted on page 225, it is the intention of the Minister to make a Regulation under which estimates for work undertaken after April 30 will be subject to an overall deduction of 10 per cent. It is clear from the correspondence that this cut is being imposed on the profession not as a result of negotiations but by the arbitrary fiat of the Minister. Indeed it had been made clear to the Department at the last conference which was held before the letter dated April 14 was written that the making of an overall reduction of this kind would almost certainly lead to a complete breakdown of negotiations between the Ministry and the Association on all matters relating to the Health Service. The action of the Minister will naturally be the subject of discussion by the Council and the Representative Board during the present weekend and further comment must therefore be withheld for the time being. It is, however, to be noted that no attempt has been made by the Ministry to base the decision to cut the scale on the findings of the Penman Committee or, indeed, on any consideration other than the overall cost of the service.

The Superannuation Regulations

THE latest version of the Superannuation Regulations has been approved by Parliament and came into force on April 1. These are consolidating Regulations which include all the various amendments made in those originally published in addition to some further ones. An explanation of the amendments of particular interest to dentists appears on p. 226. It is understood that the Ministry have in hand the preparation of a revised booklet explaining the scheme, but it will be some time before this is available.

Dental Board Accounts

THE accounts of the Dental Board of the United Kingdom for 1949 show that there was a surplus of £1,392 for the year. Interesting items in the accounts are increases in the number of fees for original registration from 342 in 1948 to 430 in 1949, and one of 174 in the number of retention fees. These figures will be reflected in due course in the Register for 1950. The former is evidence of the increased output of the schools but the latter may be due to a number of causes other than an actual increase in the number of dentists. On the expenditure side the increased production of material for dental health education cost an additional £2,836 and increased use made of the Postgraduate Bureau led to an increase of £649 in the amount appropriated for research and postgraduate education.

The D.P.S. Another Milestone

THE Dentists Provident Society was founded in 1908 by a few enthusiasts headed by Mr. G. F. Cale-Matthews. By 1910 it had enlisted no more than 73 members, a number which by all actuarial standards was too few to ensure financial stability for the infant society. The faith of the few has, however, been abundantly justified by the steady growth in the number of members and the advantages which have accrued to them. This year the membership has passed the 3,000 mark, having increased more than forty-fold on the figure of forty years ago. During that time sickness benefit of £206,000 has been paid to members and they have received a total sum of £311,500 in excess of the contributions paid by them to the Society. The average annual appointment of surplus profits has been at the rate of £1 7s. 9d. per share. The Society is in an exceedingly strong financial position, with accumulated funds in excess of £800,000, and offers to members of the British Dental Association the opportunity of combining insurance against sickness with the accumulation of a capital sum on retirement on terms which are much more favourable than those obtainable under ordinary insurance policies.

The International Dental Journal

The announcement that the *International Dental Journal* is to commence publication in September of this year marks the fruition of a scheme first set on foot in connection with the International Dental Congress which was to have been held in London in August 1941. The method which was then proposed was that the reports to be presented to the various sections of the Congress should be published, prior to the date of the Congress, in four consecutive issues of the *International Dental Journal* instead of, as formerly, in a single volume of Transactions. This procedure has many advantages, not the least is that it will enable a greater number of members to take part in the discussions of the reports and others to appreciate what is being said. The proceedings of the 1952 Congress will occupy eight numbers of the new Journal from September 1951 to June 1953. In the intervals in which the *International Journal* is not devoted to the reports of a Congress, it is to contain a series of reviews written by international authorities on various sections of dental science, and, in addition, it will incorporate a section devoted to the domestic affairs of the F.D.I. The appointment of Professor H. H. Stones as Editor of the new Journal is a sufficient indication of the scientific standard which has been set by its sponsors, and, from what is already known of the plans which have been laid, it is safe to assume that the *International Journal* will be an indispensable adjunct to the various national dental journals.

The Physical Society Exhibition

THE Physical Society's Thirty-fourth Annual Exhibition, held at Imperial College, South Kensington, from March 31 to April 5, was devoted mainly to showing new instruments and apparatus used for scientific purposes. Besides commercial firms, Government research stations and university research departments provided contributions. This year's exhibits ranged from the humble analytical balance to an electronic apparatus which counts the red corpuscles in blood automatically. Many pieces of apparatus for the measurement of radioactivity could be viewed in action ; one for measuring the radiation from the human body and another for the use of prospectors for radioactive ores. The exhibition illustrated the increasing application of physical principles to the solution of a wide range of problems and showed that the British instrument industry is keeping well abreast of the rapid advance in scientific knowledge that is now taking place.

Demand Rate Extraordinary

FIGURES given to the Tynwald of the Isle of Man show that the number of cases in which dental treatment was given approximated to 40 per cent of the whole population—men, women and children—of the Island. Some allowance must obviously be made for cases in which more than one course of treatment was given to the same patient in the year. It must also be borne in mind that the figures are probably inflated to some extent by the treatment given to visitors—it was for instance reported that in the period April 1 to November 30, 1949, 8,944 temporary residents, approximately 17 per cent of the resident population, had received medical treatment in the Island. The ratio of dentists in the Health Service to total population, 1 : 3,400, is considerably higher in the Island than that for Great Britain as a whole.

Dental Incomes in U.S.A.

AT a time when the British Press is exhibiting a tendency to emphasise the gross earnings of dentists it is something of a relief to find the U.S. Department of Commerce expressing the earnings of the profession in terms of net income. According to a recent survey carried out by the Department the average U.S. dentist had a net income of $6,912 in 1948. The results of this survey are contained in a report which can be obtained without cost on application to the American Dental Association's Bureau of Economic Research and Statistics. *The A.D.A. News Letter* for February 1, 1950, gives some interesting excerpts from the figures. It appears for instance that the average income of members of the A.D.A. was $3,300 higher than that of non-members. Salaried dentists had an average income of $5,358. The age distribution of earnings follows the usual pattern but the geographical distribution shows some unexpected results, the Far West leading the rest of the country with an average of $9,751, whereas the average in New York, with one-tenth of the dentists in the States, was only $5,609. The average income of specialists was approximately one and three-quarter times as great as that of general practitioners.

Fifty Years Ago

From the "Journal of the British Dental Association," April 14, 1900.

I believe surgeons have a little book or list of fees, and that, like cabmen, they have a regular tariff for distances, but whether it is a sacred ritual confined to the initiated, or whether they ever submit it to the profane gaze of the public, I do not know. If a new patient asks me what my fees are, I request to be allowed to examine the mouth and see what has to be done. If I am pressed to dispense with this and still give an idea, I may mention my minimum fee, but say I cannot possibly tell whether the case is simple or complicated without seeing it, and I may then make what other explanation seems good to me. I often wonder if this is more unprofessional than having a nice little book with a nice little list of nice little fees, presenting it to patients with my best smile and bow, and telling them my waiting-room is at their disposal until they have mentally digested its contents (the book, not the room).

From a paper on "Dental Fees" by W. Cass Grayston.

LETTERS TO THE EDITOR

RATIONAL DENTISTRY

SIR,—The article aptly named "Rational Dentistry" in the March 17 issue of the Journal reminds me that I have recently had the good fortune to read a book which was reviewed in your columns earlier in the year. It was entitled "Dental Caries, Clinical and Experimental Investigations" by Mr. Ockerse, Dental Health Officer, Pretoria.

The investigations, among some 67,000 white school children in South Africa, reveal that 85 per cent of them have carious teeth but this percentage varies in the 117 districts of the Union from 100 per cent to 20 per cent. The three districts with the lowest caries incidence are Gordonia (28 per cent), Namaqualand (25 per cent) and Henhardt (20 per cent). I do not know how exhaustive was the survey for determining the fluorine content of the water. (The majority of the symbols on the accompanying map indicate "Fluorine not determined.")

But it would appear from data given for only eight districts, that the caries incidence varies in inverse proportion to the P.P.M. of fluorine in the water.

Your reviewer suggests that the author's particular interest is in fluorine. May not his interest have been focused so intently in this direction that he has failed to draw any conclusions from another factor which may be equally significant? This has by no means escaped his observation and he has indeed recorded it most carefully. I refer to the observation that the diet of the children in the low incidence areas consists of large amounts of meat, originally game, and whole-meal bread made from locally grown wheat ground in small wind-driven mills. Because of increasing scarcity of game, more carbohydrates are being consumed but, as these are sheep-rearing areas, it may be presumed that meat is not scarce.

Many of the families, especially in Namaqualand, move with their sheep when the grazing is exhausted to "pastures new" i.e., their carbohydrate food is grown upon virgin soil as is the food of the animals which supply the rest of their diet.

The high proportion of protein in their diet, combined with a high fluorine intake, is noted as being a possible reason for their relative immunity.

This suggestion is supported by reference to the high protein consumption and low caries incidence of the Marai tribe, the Lewis islanders and the Eskimos.

On the other hand, the low caries incidence of primitive South African natives on a diet of mealie porridge, of Italian peasants with their largely carbohydrate diet, of the Hunza valley natives who are vegetarians for six days of the week, would appear to make nonsense of this assumption. Is it so very unreasonable to suggest that the low caries rate and well developed jaws and teeth noted in these South African districts *may* be due to the condition of the soil which produces the food of both human and animals.

I suggest that preoccupation with the problems of deficiencies in diet and the resultant problems of artificially replacing those deficiencies should not exclude the possibilities of deficiencies in the soil which is the source of our food and of mistakes which may be made in the preparation of that food for our consumption.

59, *Upper Walthamstow Road, E.*17. Yours faithfully,
L. W. ELMER.

AN EMERGENCY CAP SPLINT

SIR,—A case of a young boy of eleven with fractured upper centrals recently presented himself requiring a splint.

I was able to make and fit a useful cap splint in one hour using the new cold curing Simplex (Pentocryl).

The method employed was to cast an impression of the teeth in plaster with salt, build up the fractured incisors with wax and cover with Ash No. 7 casting wax as for the ordinary cast splint. Subsequently I cast an overbite which I squeezed lightly in the press in order to make the top surface of the overbite parallel to the under surface of the model.

When the overbite had set, I separated and boiled out the wax, painted with cold mould seal and packed with the cold curing acrylic. Thereafter, the overbite and model were placed in a small spring clamp, screwed up and placed in warm water.

After ten minutes, the model and overbite were separated and the splint cut up and fitted in the usual way.

I confess to having a cynical attitude to this new aid to dentistry but have found it invaluable in the above instance and where only a temporary repair has been called for. Practically my experience has been that it is extremely difficult to obtain sufficient pressure to prevent porosity.

3, *Seafield Road, Southbourne, Bournemouth.* Yours faithfully,
G. E. RAY.

REVIEWS AND ABSTRACTS

DENTAL PRACTICE MANAGEMENT. By S. L. Drummond Jackson. Second Edition. Staples Press, Ltd. London and New York. Pp. 370. Figs. 85. Price 30s.

This book deals most comprehensively with this vast and complicated subject. It is in fact obvious that the author has had the greatest difficulty in condensing his material. He has achieved this by adopting note-form at the expense of some loss of fluency and style, and the book is consequently better considered as a reference work.

The young graduate is introduced to the methods of entering practice. There are valuable chapters on Assistantship, Partnership and the Purchase of a Practice, containing suggested forms of agreement and outlining in detail the various pitfalls to be encountered.

Perhaps the greatest value of these chapters to the young entrant in these days of National Health Dentistry, is the insistence throughout on the need for the high ethical standards of the past, which may not be so apparent to the younger man apt to

be bemused by the " get rich quick " attitude which can be engendered only too easily by present conditions. In Mr. Drummond Jackson's words " Some careful thinking ahead at present will save an awakening, too late, to the results of the inconsequent morals of some long forgotten political cheapjack."

Subsequent chapters deal in the greatest detail with Income Tax, Insurance, Book-keeping, The Treatment of Children, Laboratory Administration and there is a most valuable chapter on the Training of Surgery Assistants.

The book will prove of great value to all practitioners for there is no aspect of private practice which is omitted. Its value is enhanced by a good index and complete bibliography. The second edition is most timely as it will play its part in maintaining a high ethical and professional standard at a period in the history of our profession when this is all important.

HISTOPATHOLOGY OF THE TEETH AND THEIR SURROUNDING STRUCTURES. By Rudolf Kronfeld, B.S., M.D., D.D.S., and Paul E. Boyle, D.M.D., Professor of Oral Histology and Pathology, The Thomas W. Evans Museum & Dental Institute, University of Pennsylvania. 3rd Edition, revised and re-edited. Henry Kimpton, London. Pp. 514, figs. 464. Price 56s.

Since its first appearance sixteen years ago this book has steadily improved its reputation and the appearance of a 3rd edition will be generally welcomed. Following the regretted death of Dr. Kronfeld it has been revised and partly rewritten by Dr. Boyle with the assistance of several colleagues. In general layout the book remains the same but there are some additional illustrations, many amendments in detail, and the chapter on dental caries has been rewritten by Dr. N. B. Williams.

It can be said at once that it is an excellent book and that the only criticisms which are to be made are minor ones. Thus, in a book which necessarily requires considerable size to cover the morbid histology alone, it seems a pity to increase the bulk by including several other things certainly germane but not essential. Was it necessary to include a general survey of the caries problem from all aspects, for the student will certainly have to pursue this matter more fully in other books ? And why include clinical aspects such as the differential diagnosis of toothache and of oral cysts ? There are also many parts of the first two chapters which do not fall strictly within the histological field. In place of these other things might have been included or more fully considered with advantage in a book otherwise so comprehensive—the effects of scurvy, hereditary enamel disorders, different degrees of faulty enamel structure. The section on tumours of the oral cavity is also severely restricted in extent. The statement that the dentinal tubules in the dead tract of Fish become " filled with air " does not agree with the findings in fresh specimens.

In very many respects the text has been improved and in particular we may note that the section on Periodontosis, very unsatisfactory in most books, is intelligent and stimulating, and the reference to Albright's and Selye's work, though its application to dentistry awaits confirmation, is a very justifiable speculation. This book can be strongly recommended not only to students but to practitioners who want to understand the conditions they are treating and the results that treatment produces.

Organic Pattern : Neonatal and Incremental Lines.—Many authorities have declared the brown striæ of Retzius to be due to a poorly calcified zone of enamel. If this were correct complete decalcification should tend to eliminate this difference in degree of calcification and the striæ should not be present in decalcified preparations. The examination of paraffin sections of deciduous enamel prepared by Sognnaes' low temperature technique shows that the incremental pattern, brown striæ and neonatal line, is preserved. It appears that this pattern is caused mainly by the morphology of the organic prism sheaths. In the brown striæ the prism sheaths are thicker.—SOGNNAES, R. F. (1949) *J. dent. Res.*, **28**, 558.

Bowen's Disease of the Mucous Membrane of the Mouth.—Bowen's disease is a condition of skin or mucosa which is regarded by some as a precancerous dyskeratosis and by others as a laterally spreading intra-epithelial type of epithelioma. Metastases only occasionally occur but when they do there may be no gross or microscopic evidence of penetration of the basement membrane by the primary lesion. The actual appearance of the lesions when they occur in the mouth depends upon the degree of keratinisation and the length of time the lesion has been present. If keratinisation is absent the lesion is an erythematous velvety patch which may be raised slightly above the surface of the mucosa. If the lesion is keratinised the erythema is masked by white patches. The surface may be nodular or papillomatous, or ulcerated. This condition is slightly more common in men. Various parts of the mouth may be affected and lesions are sometimes multiple. It is most common after middle age. Microscopically the appearances are characteristic. The squamous layer is thickened, with various degrees of acanthosis. Hyperkeratosis and parakeratosis may be present and there may be small hyaline pearls. The epithelial cells vary in size and shape, some of them being bizarre giant cells with numerous nuclei. Mitoses are usually abundant. Foam cells are occasionally found and many cells are vacuolated. The basal cell layer remains intact but the typical palisade formation is often disturbed and the submucosa is heavily infiltrated with inflammatory cells. The deeper layers of the submucosa, however, are free of inflammatory cells. Eleven cases of Bowen's disease of the oral mucosa have appeared in the literature and six new cases are described by the author. In four of the cases described the condition was associated with squamous cell epithelioma of the region and in one other case with an epithelioma of the larynx. Surgical excision, destruction by diathermy, radiotherapy have all been recommended for this condition. Treatment with caustics or ultraviolet light is contra-indicated. —GORLIN, R. J. (1950) *Oral Surg.*, **3**, 35.

THE HEALTH SERVICE

CUT IN THE SCALE

THE following letters from the Ministry of Health dealing with an immediate cut in the scale of fees have been received by the Secretary of the Association :

30*th March*, 1950.

DEAR SIR,

The Association will be aware that in the Debate on the Supplementary Estimates on 14th March, the Chancellor of the Exchequer emphasised the necessity for justifying mounting expenditure and announced that the National Health Service would be thoroughly examined in all its incidence to make sure that money was not being wasted or ill-spent. This examination is now taking place, and among the questions to which consideration is being given, the Minister has felt compelled to have regard to the fact that, notwithstanding the reduction made last summer, very large sums of money—far higher than either the Minister or (as he believes) the dental organisations contemplated when the original scale of fees was discussed—are still being paid in respect of general dental services. This is, moreover, taking place at a time when it seems reasonable to assume that the greatly increased amount of work done must have resulted in a relative reduction in the ratio of overhead expenses.

While it is true that an investigation to establish the correct ratio of practice expenses has already been begun with the full co-operation of the profession it is not considered that in present circumstances further action can be delayed during the long interval which must otherwise elapse until the results of this investigation are known and subsequent negotiations have taken place. It is accordingly desired to discuss with the profession the proposal that a further reduction in the present rate of remuneration should be made forthwith, on the understanding that the position will be again reviewed when the results of the investigation now proceeding are known and discussions on the Report of the Working Party on Chairside Times have been completed.

In order to avoid the disturbance cause by constant alterations in the actual Scale of Fees it would seem preferable to effect the reduction by deducting a percentage from the aggregate total fees in respect of work undertaken after the date on which the new arrangement comes into force.

In present circumstances it is considered essential that discussions should be completed at the earliest possible date and in any case by the 19th April. The Minister would therefore be glad to be informed as soon as possible when it will be convenient for representatives of the Association to attend.

The Secretary of State for Scotland wishes to be associated with the views expressed in this letter.

Yours truly,

E. M. R. RUSSELL SMITH.

The Secretary,
The British Dental Association,
13, *Hill Street,*
*W.*1.

14*th April*, 1950.

DEAR SIR,

With reference to my letter of 30th March and to the discussions which have subsequently taken place between representatives of the Association and officers of the Department, very careful consideration has been given to the representations which have been made. The Minister fully understands the view that a sliding scale of reductions applicable to higher earnings would, if practicable, be preferable to a cut applied to all earnings at the same rate. There are, however, serious difficulties in working out a scheme for a sliding scale of reductions, which involves problems likely to take some time to solve. In the meantime the need for reducing the very large sums of money now being paid in respect of general dental services is becoming increasingly urgent, and the Minister does not consider that it would be justifiable to wait until a scheme for a sliding scale of reductions could be worked out and brought into operation. He therefore proposes as interim action to reduce the amount paid on estimates for work undertaken after 30th April by 10 per cent, this reduction to be effected by deducting 10 per cent from the aggregate total fees in respect of such work, in order to avoid disturbing the present scale of fees. The Minister is, however, prepared to consider substituting for this arrangement a scheme for a sliding scale of reductions applicable to higher earnings which would result in no less a saving, if and when a practicable scheme can be worked out to his satisfaction, with as he hopes the agreement of the profession and he trusts he can count on the co-operation of the profession to this end.

Yours truly,

E. M. R. RUSSELL SMITH.

NOTES FROM HEADQUARTERS

FROM OUR SPECIAL CORRESPONDENT

Acceptance for Treatment

IN a number of recent cases where a dentist whose name appears on an Executive Council list has accepted a person for private treatment, as a fee paying patient, the patient has subsequently alleged that he was accepted for treatment under the Health Service. As a result the dentist has had difficulty in recovering a fee for the treatment, and in some cases has been subjected to an enquiry by the Dental Service Committee on complaint of the patient alleging breach of the Terms of Service. It is thought that members would find it helpful to have some advice how best to protect themselves against difficulties of this kind.

The first question is what constitutes acceptance of a patient for treatment under the Health Service. It seems clear that it is not necessary for such an acceptance to be made in writing in order to be binding upon the dentist. The appropriate Regulations do require that in accepting an applicant for treatment the dentist must complete part 6 of the Form E.C.17 and give it to the applicant, but the acceptance may be complete, and binding upon the dentist even where this Form has not been completed. If, for example, the patient says " Will you treat me as a Health Service patient ? " and the dentist replies " Yes,"

there is on the face of it both a valid contract at common law and an acceptance for treatment for the purpose of the National Health Service Regulations. This means that thereafter the dentist who charged a fee for that treatment would be unable to recover it in law, and might be guilty of a breach of his terms of service. Where, however, the question to the dentist was in general terms, such as " Do you see patients under the Health Service ?" the answer " Yes " by the dentist would not appear to place him under any obligation to treat that particular questioner under the Health Service, and the dentist would remain free to accept or refuse the applicant at a later stage, as he thought fit.

Acceptance by Employee

In certain circumstances it is possible for a dentist to be bound where an employee of his accepts a patient for treatment under the Health Service. This is clearly the case where the dentist has given his employee specific authority to do this. It may, however, also happen where there has been no specific authority given, but where it is within the " ostensible authority " of the employee to accept patients ; that is, where the public would reasonably assume from the status and duties of an employee that he or she had the right to accept patients on behalf of the employer. Where an employee with this ostensible authority accepts a patient, the employer will be bound by this acceptance except only where he has given sufficient prior notice to the public that his employee has not in fact the necessary authority from him.

Where the practitioner wishes to safeguard himself in the event of any dispute arising whether or not a particular patient was accepted for treatment under the Health Service the following are two steps which he could usefully take :—

(1) Issue clear instructions to his staff that they are not to accept patients on his behalf for Health Service treatment, but are to indicate to enquirers that this is a matter which is decided by the dentist after he has seen the patient and examined the patient's mouth.

If these instructions are given the dentist will be able to show clearly that he has reserved for himself the right to accept Health Service patients in his practice : and if they are obeyed, difficult questions whether an employee has ostensible authority are unlikely to arise.

It would be an additional safeguard if the instructions were in writing, and it is suggested that some members may like to have a statement of the following kind signed by all employees in their practices :—

I understand that Mr. X alone has the right to decide which patients he will accept for treatment under the Health Service, and that I have no authority to accept any patient for such treatment on his behalf.

Signed . . . . . Date . . . . . .

(2) Exhibit in his waiting room a notice in the terms recommended by the Association : viz. :—

NOTICE TO PATIENTS

Acceptance of a patient by a dentist for treatment under the National Health Service Act, 1946

A dentist is not obliged to accept any individual patient for treatment under the National Health Service. If he does so the patient must sign the Dental Estimate Form at the first visit and receive a signed acceptance (Part 6 of the Form) from the dentist. Unless this is done he will be regarded as a private patient liable to pay the dentist's fees.

Approved by the Representative Board of the British Dental Association, October 1949, and issued under the authority of the . . . . . Local Dental Committee.

As has been said above, the completion of Part 6 of Form E.C.17 is not essential to the making of a valid contract for treatment, and the exhibition of this notice does not of course alter the law in any way. The great value of the notice is that if dispute arises the fact that a dentist has it exhibited in his waiting room provides strong evidence that his normal practice is never to accept a patient for treatment until he has seen the patient himself, and until he gives him Part 6 of the Form. It may be necessary for the dentist to defer acceptance of the patient until such time as he himself chooses and if the patient has never received Part 6 of the Form, he will in such circumstances be hard put to it to prove that the dentist ever accepted him for treatment under the Health Service.

SUPERANNUATION

THE National Health Service (Superannuation) Regulations, 1950 which came into force on April 1, 1950, are mainly consolidating Regulations, and incorporate the original Regulations made in 1948 together with two sets of amending Regulations made since then. There are, however, a number of changes introduced which are of interest to members of the profession.

Employer's Contribution

Hitherto a general dental practitioner employing an assistant has been required to pay the 8 per cent employers contribution in respect of that assistant. These Regulations provide that the employer's contribution will henceforward by paid by the State.

Income Ranking for Superannuation

Under the 1948 Regulations a practitioner accumulated superannuation rights on the total of his net earnings, whatever their amount. The new Regulations provide that earnings in excess of £3,500 per annum net, will in future be disregarded for superannuation purposes. Any earnings in excess of the maximum will not be subject to the 6 per cent deduction in respect of the practitioner's contributions.

Widow's Pension

Under the 1948 Regulations the widow's pension was calculated on a basic figure of one-third of the husband's pension, but was subject to adjustment according to the age of the widow, upwards if she was older than her husband, downwards if she was younger. The new Regulations put an end to this adjustment.

Non-Statutory Superannuation Schemes

Persons who before becoming officers of an employing authority in the Health Service were subject to a non-statutory superannuation scheme were by the 1948 Regulations given three months within which they could elect to stay under that scheme rather than join the Health Service scheme. Those who elected to stay in this way are now given the opportunity to change their minds, and join the Health Service scheme provided that they notify their employing authority before October 1, 1950.

REGIONAL HOSPITAL BOARDS

THE Minister of Health has made 131 appointments or re-appointments to fill the vacancies on Regional Hospital Boards consequent upon the retirement on

March 31 of one-third of the members of the Boards. The list of new members contains the name of Mr. Thomas Roger Haggarty, L.D.S.Glas., who has been appointed to the North East Metropolitan Regional Hospital Board.

QUESTIONS IN PARLIAMENT

Dentist's Remuneration

MR. I. MACLEOD (Enfield W.) asked the Minister of Health on March 30 whether in conjunction with the Secretary of State for Scotland he would appoint a committee to review the recommendations of the Spens Committee on Dental Remuneration in the light of experience gained since the inception of the Health Scheme.

In a written reply Mr. Bevan said: " No. Discussions on dental remuneration are already taking place between representatives of the dental profession and officers of the Health Departments."

Mr. McNeil, Secretary of State for Scotland, in a written reply to Mr. A. Edward Davies (Stoke on Trent, North), said that the recent report of the Auditor General on the abnormally large earnings of a Scottish dentist related to the earnings of a dentist and his assistant in the six months ended December 1948. Since then the scale of dental fees had been reduced by approximately 20 per cent and the current scale was again under discussion between representatives of the dental profession and officers of the Health Departments.

Public Dental Service

SCHOOL HEALTH SERVICE ANNUAL REPORTS FOR 1947

THE reports by Senior Dental Officers included within the School Health Service Annual Reports for the year 1947 convey that during that year there was, in general, serious understaffing but, at the same time, there was evidence of optimism that the position might improve with the introduction of the National Health Service Act in July 1948.

Birmingham County Borough.—Mr. E. Davies Thomas, Senior Dental Officer, reported that although a few additional officers had been appointed during the year, the staffing position at the end of the year was one dental officer to 10,000 children. In such circumstances it is not surprising that the total number of teeth extracted (8,647 permanent and 46,549 temporary) was considerably in excess of the number of teeth filled (13,710 permanent and 449 temporary). It is obvious that the 1947 dental staff would need to be more than doubled in order for Birmingham to provide a comprehensive School Dental Service.

Derbyshire County Council.—Mr. H. E. Gray, Senior Dental Officer, commented on the serious staffing position (only 10½ dental officers for a school population exceeding 87,000). The statistical table shows that out of 51,720 children inspected, no less than 42,028 were " Specials," and it is, therefore, no wonder that Mr. Gray reported that the treatment cases included many " casuals " for the relief of pain. In spite of the understaffing and of the enormous demand for emergency treatment from toothache cases, much constructive work of a routine nature was carried out, and Mr. Gray is to be congratulated on the results. The fact remains, however, that Derbyshire cannot expect to have a satisfactory dental service until the 1947 staff is more than doubled.

Lincolnshire-Lindsey County Council.—Mr. J. D. Sykes, Senior Dental Officer, reported on the numerical inadequacy of the dental staff, which was only one-third of the authorised establishment. In these circumstances, it is not surprising that no less than 961 permanent teeth and 6,489 temporary teeth had to be extracted from the mouths of 9,007 children who were treated. Fillings numbered 2,972 in permanent teeth and 663 in temporary teeth.

Northumberland County Council.—Mr. A. E. Robinson, Senior Dental Officer, reported an improvement in the condition of the teeth and oral tissues of the county children, and that 33·8 per cent were found at routine dental inspections to be dentally sound. It would appear from the report that the dental staff was at full establishment, but in spite of this unusual feature, it still proved impossible to deal with all the children in the county, and so the establishment was to be increased by seven dental officers within the next two years. It is obvious that Northumberland have adopted a progressive and sound policy in regard to the provision of dental treatment, and first-class results should be achieved when the augmented staff has been in operation for a few years.

Oxford County Borough.—Mr. J. F. Allen, Senior Dental Officer, reported that owing to shortage of staff one dental clinic had been closed. 5,977 children received treatment, which included the extraction of 461 permanent teeth and 3,886 temporary teeth. Fillings in permanent teeth were 9,828, and in temporary teeth 1,140. From the foregoing statistics it may be assumed that the teeth of the children in Oxford were being maintained in a reasonably satisfactory condition in spite of the shortage of staff.

Stoke-on-Trent County Borough.—Mr. V. R. Morgan, Senior Dental Officer, reported that at the end of the year the dental staff was below approved establishment to the extent of three dental officers, and that as a result of this position, it was proving impossible to keep up to date with dental inspection and treatment. 8,838 children received treatment, which included the extraction of 2,856 permanent and 15,027 temporary teeth. Fillings in permanent teeth numbered 4,185 and in temporary teeth 1,262.

Dental News

JUBILEE OF THE BELGIAN STOMATOLOGICAL SOCIETY

THE Société Belge de Stomatologie is celebrating the Jubilee of its Foundation by holding an International Congress of Stomatology at Knocke-sur-mer from May 18 to 22, 1950. An attractive programme of papers, demonstrations, table clinics and films has been arranged and numerous social functions will be held in connection with the Congress. The Secretary of the Committee of Organisation is Dr. A. Reychler, 5 rue de Jacobines, Bruges.

PROPOSED SALARY INCREASE

MIDDLESBROUGH Education Committee have adopted a recommendation that the salary of the Chief School Dental Officer should be increased by £275, i.e. from £952 to £1,227 per annum. It was reported that the two assistant dental officers had resigned and only the Chief Dental Officer was left to carry on the school service.

DENTAL BOARD OF THE UNITED KINGDOM

Income and Expenditure Account for 1949

INCOME.	£ s. d.	£ s. d.
To Fees :—		
Fees for original Registration, 430 at £2 each	860 0 0	
Fees for Retention, 11,623 at £2 2s. each	24,408 6 0	
Fees for Retention, 590 at £1 1s. each	619 10 0	
Fees for Retention, 144 at £1 each	144 0 0	
Fees for Restoration after erasure at £1 each	275 0 0	
Fees for Registration of Additional Qualifications at £1 each	142 0 0	
Fees for Change of Name at 5s. each	15 5 0	
Fees for Extract Certificates at 2s. 6d. each	1 0 0	
		26,465 1 0
„ Sale of Publications :—		
Dentists Register (Official Issue) and List of Names, Deaths, etc.	996 2 0	
Dentists Register (Office Edition)	576 5 0	
Other Publications	3 19 8	
		1,576 6 8
„ Bank Interest	100 10 1	
„ Interest on War Stock 3½%	307 15 10	
„ Interest on Defence Bonds 2½%	62 10 0	
„ Interest on Transport Stock 3%	423 14 8	
„ Interest on National War Bonds 2½%	198 5 4	
„ Interest on Savings Bonds 2½%	506 19 10	
		1,599 15 9
	£29,641 3 5	

EXPENDITURE.	£ s. d.	£ s. d.
By Fees and Travelling Expenses :—		
Members, attendance at meetings	2,168 6 0	
General Medical Council, transaction of dental business	300 0 0	
		2,468 6 0
„ Printing :—		
Dentists Register	1,195 3 1	
Minutes, Programmes and Reports	279 10 0	
General	308 1 7	
		1,782 14 8
„ Salaries and Wages		6,584 17 8
„ Pensions Reserve :—		
Amount appropriated		3,738 12 0
„ Office Expenses :—		
Travelling Expenses	2 4 2	
Postage	355 11 9	
Stationery	287 15 6	
Rates	299 3 9	
Ground Rent	155 0 0	
Heating and Lighting	155 6 1	
Repairs, Cleaning, etc.	303 1 6	
Insurance	32 16 3	
Telephone	87 2 11	
Office Equipment	1,099 0 2	
Lease Redemption Policies	297 5 0	
	3,074 7 1	
Less Rent received	100 0 0	
		2,974 7 1
„ Law Expenses :—		
Solicitor's Charges	594 7 3	
Disbursements	799 8 9	
		1,393 16 0
„ Income Tax		495 17 8
„ Miscellaneous Expenses :—		
Expenses of Meetings	402 16 5	
Auditors' Charges	105 0 0	
Sundries	193 9 5	
		701 5 10
„ Visitation and Inspection of Examinations :—		
Expenses incurred by General Medical Council		963 8 1
		21,103 5 0
„ Educational Grants		1,522 7 5
„ Dental Health Education	4,036 8 6	
Less Sale of Publications	181 3 5	
		3,855 5 1
„ Grants for Research and for Post-graduate Dental Education	1,785 10 6	
Less Sale of Lectures	17 11 10	
		1,767 18 8
		28,248 16 2
„ Balance, surplus		1,392 7 3
		£29,641 3 5

ANÆSTHETIC GAS CYLINDERS

With the object of reducing anæsthetic risks the Association of Anæsthetists of Great Britain and Ireland and the Medical Defence Union have collaborated with the British Standards Institution in preparing a code of practice for anæsthetists. They have also approved recommendations concerning the colouring and marking of cylinders. These recommendations form a short-term policy.

A long-term policy was laid down in a series of resolutions, on the colouring and marking of cylinders and the use of non-interchangeable regulating valves, adopted at a meeting at the Royal College of Surgeons on January 25 which was attended by representatives of the Ministry of Health, the Royal College of Surgeons, the Royal College of Obstetricians and Gynæcologists, the Association of Anæsthetists, the British Standards Institution, the Faculty of Anæsthetists, the British Medical Association, the British Dental Association, the Medical Defence Union, and the World Medical Association. The following resolutions were passed unanimously:

1. That this meeting, in view of the number of deaths resulting from incorrect coupling of medical gas cylinders, strongly recommends that non-interchangeable couplings for medical gas cylinders as described in the draft code of practice agreed by the technical committee (CHE/20) of the British Standards Institution, be introduced at the earliest possible moment.

2. That representations be made to the Ministry of Health and that a copy of the decision of this meeting with regard to the adoption of the non-interchangeable coupling be sent to the Ministry for information and action.

3. That this meeting endorses the British Standards Institution's request that the Ministry of Health should approach the American Bureau of Standards.

4. That those present at this meeting should approach their opposite numbers in the United States of America.

5. That those present should meet again in four months' time to receive reports on the progress of the steps taken.

6. That the above resolutions should be published in the medical and dental press and communicated to the medical departments of the Services, who should be asked to approach their opposite numbers in the United States and the Dominions.

THE INTERNATIONAL DENTAL JOURNAL

THE Fédération Dentaire Internationale announce that they will shortly publish a new quarterly journal—the *International Dental Journal*—under the chief-editorship of Professor H. H. Stones, Director of Dental Education at the University of Liverpool. It is intended that the Journal shall provide a truly international review of new discoveries and developments in all branches of dental science; to ensure this world-wide coverage, correspondents for different languages have been chosen from among the most eminent dentists in Europe and elsewhere.

A section of the Journal will be devoted to the Bulletin—the record of the domestic affairs of the F.D.I. In addition the Journal will provide the only official record of the Quinquennial International Dental Congresses. The four issues, September 1951 to June 1952, will be devoted to the various papers which are to be submitted to the International Dental Congress to be held in London in July 1952. The four subsequent issues will record discussions arising out of these papers and commentaries on any exhibitions which may have been held.

The Journal will be printed in English but in addition the table of contents with subheadings and summaries to articles, and captions to illustrations will be printed in French, German, Spanish and Italian.

The Journal will be fully illustrated with photographs, diagrams and tables.

Publication will start in September 1950. Subscriptions may be placed with the distributors Messrs. Cassell & Co., Ltd., 37/38, St. Andrews Hill, London, E.C.4, or with any bookseller. The annual subscription is £2 5s. post free, single copies 12s. 6d. post free.

HISTORY OF MEDICINE

A SERIES of ten lectures under the general title " A Retrospect of Medicine and Science " is being given in the University of Edinburgh during the Summer Term. The course includes a lecture " A Survey of British Dentistry " to be given on May 15 at 5 p.m. by Mr. J. Menzies Campbell. The course is open to students and graduates of the University and members of the staff without payment of fee. The fee for others is 10s. in lieu of matriculation fee. The final lecture " Social Medicine in the Nineteenth Century " is to be given by Professor R. Shryock, Johns Hopkins University, Baltimore.

MR. BRYAN J. WOOD'S PORTRAIT

THE presentation to Mr. Bryan J. Wood of his portrait, painted by Mr. Frank O. Salisbury, will be made by the President of the Association at a short ceremony to be held at 13, Hill Street, Berkeley Square, London, W.1, at 4.30 p.m. on Saturday, May 13, 1950.

DENTIST APPOINTED JUSTICE OF THE PEACE

MR. A. B. KENNEDY of New Kent Road, London, S.E.1, who is a member of the London County Council, has been sworn in as a Justice of the Peace for the County of London.

The Schools

University College Hospital Dental School.—The Annual Clinical Meeting and Reunion of the School will be held on Saturday, May 6. In the morning there will be a series of demonstrations at the Dental Hospital, Great Portland Street, and clinical cases will be shown by Mr. J. L. Dudley Buxton and Mr. Alan Shefford. The afternoon session will be at the University College Hospital and Medical School, University Street. At this there will be a series of operations under general anæsthesia in the main theatre of the hospital, and films of dental interest including " Gold Inlay Technique," " Silicate Cement Fillings " and " National Technique for the Edentulous Case " will be shown from 2–4.30 in the Medical School. In the evening there is to be a dinner-dance at the Dorchester Hotel.

KING'S COLLEGE HOSPITAL DENTAL SCHOOL

King's College Hospital Dental School is holding a Clinical Meeting on the afternoon of Saturday, May 13, 1950, commencing at 2 p.m. All past students of King's, staff and students of other dental schools, and dental practitioners, will be most welcome.

Manchester University.—Mr. J. N. Peacock, L.D.S. Manc., has been appointed Clinical Lecturer in Dental Surgery.

Examination Results

Royal College of Surgeons of Edinburgh.—*Final L.D.S.*—R. A. Corke, A. Regenstreif, I. vZ Marais, S. Mendick, I. J. Stewart, J. M. Thomas, W. A. McMaster, W. Lisowski, J. D. McGrail, T. L. Henderson, K. S. McPhail, T. S. Leonard, Mrs. W. M. Sladen, M. le R. Marais, E. W. Evans.

The University of Liverpool.—*Final B.D.S.*—F. Harrison, J. D. T. Oldham, J. W. Turnell. *Final L.D.S.*—D. W. Dickinson, H. G. Helliwell, D. P. James, R. Storer.

The Services

The Royal Navy.—Surgeon Captain (D) F. R. P. Williams, *O.B.E.*, B.D.S., F.D.S. R.C.S.Eng., Deputy Director for the Dental Services of the Royal Navy, has been appointed honorary dental surgeon to the King.

Correction.—Surgeon Captain (D) J. T. Wood became Deputy Director for Dental Services on February 26, 1946, and not, as stated in the Journal of March 17, on February 6, 1949.

R.A.F. RESERVES CLUB

AN invitation to join the R.A.F. Reserves Club is extended to past and present officers of the R.A.A.F. and the R.A.F.V.R. and to former officers of the R.F.C., R.A.F. and R.N.A.S.

The President of the Club said, in a recent speech, " The Royal Air Force relies on its Reserves to enable it to meet any national emergency and this Club plays a vital part for the Service in providing a meeting place for officers of the Reserves."

Subscription rates for the Club are London members £2 2s. ; Country members £1 1s. ; Overseas members 10s. 6d. The facilities include dining room, bars, ladies' lounge, reading and writing rooms and sleeping accommodation. Full particulars of the Club can be obtained from the Chairman, Membership Committee, R.A.F. Reserves Club, 38, Hill Street, London, W.1.

GOLDEN WEDDINGS

CONGRATULATIONS will be extended to Mr. and Mrs. Stephen D. Hey of Bournemouth and to Mr. and Mrs. W. Ford of Lydd who celebrated their Golden Weddings on April 11 and 12 respectively. Mr. Hey practised in Leeds before migrating to Wimpole Street and was on the staff of the Leeds Dental School and the Leeds General Infirmary. He has been a member of the B.D.A. since 1898.

Mr. and Mrs. Ford are both dentists and both were members of the I.D.S. prior to the amalgamation with the B.D.A. They enjoy the unusual distinction of both husband and wife being councillors of the Borough in which they reside.

Obituary

DENIS LEONARD POWER, L.D.S.Eng.

An Appreciation

A fellow student and close friend J. S. writes: "Denis Leonard Power, whose obituary notice recently appeared in the Journal, entered Guy's Hospital Dental School from Charterhouse and qualified in March 1939. He was a good games player and obtained 'blues' for swimming and tennis during his time at Guy's. Serving in the dental branch of the R.A.F. from the outbreak of war, he reached the rank of Squadron-Leader, ultimately being attached as dental member of the team working on jaw and facial injuries, at Rawsby Hospital.

"After demobilisation he joined his father in practice and by his capability gained the confidence and affection of his patients.

"Denis with his forceful personality, good humour, great personal charm and character, will be sadly missed by his numerous friends. He leaves a widow and two children, and the deepest sympathy is expressed to them and also to his parents Mr. and Mrs. H. L. Power, his brother Norman, and his sisters, at their irreparable loss."

Charles Gee, L.D.S.Birm., of Leek, Staffordshire, died suddenly on March 26, aged 53. He qualified in 1922 and joined the B.D.A. in the same year. He leaves a widow, one son and two daughters.

The Charge for Announcements of Births, Marriages and Deaths is 2*s.* 6*d. per Line.* (*Approximately* 8 *words.*) *Minimum* 7*s.* 6*d.*

Births

CLOW.—At Leicester, on March 20, 1950, to Betty, wife of John B. Clow, L.D.S., 24, Aberdale Road, Knighton, Leicester, a son.

CUTHBERTSON.—On March 31, 1950, at St. George's Hospital, London, S.W.1, to Joan, wife of George A. Cuthbertson—a son.

HARDIE.—At Charleton Home, on April 9, to Margaret (*née* Payn), wife of John Blair Hardie, Links Lodge, Montrose, Angus, a son—Richard Ewen.

HAYES.—On April 2, at Woking Maternity Hospital, Woking, to Irene (*née* Stuart), wife of J. L. Hayes, L.D.S. R.C.S.Edin., a sister (Susan Mary) for Trevor.

KETTLE.—On April 5, to Edith Kettle, L.D.S. (*née* Crawford), wife of Gerald Kettle, L.D.S., a daughter.

SARTORY.—At Chiswick Maternity Hospital, to Pamela, wife of Francis B. Sartory, L.D.S. R.C.S.Eng., a daughter (Elizabeth Lillian)—a sister for Geoffrey.

TAIT.—On March 16, at Craig Beuno Nursing Home, Bangor, N. Wales, to Mr. and Mrs. W. D. Tait, a daughter.

Marriage

BANTIN—COPEMAN.—On March 12, at St. Gabriel's Church, Cricklewood, Bernard D. Bantin, younger son of the late Mr. Benjamin E. Bantin and Mrs. Bantin, of 132, Chamberlayne Road, Willesden, to Betty G. M. Copeman, younger daughter of Mr. and Mrs. Harry C. Copeman, of 135, Leighton Gardens, Harlesden.

Golden Wedding

FORD—JEZARD.—On April 12, 1900, at St. John's Church, Margate, William Ford, Preston, to Maria Florence Jezard, Margate. Present address: High Street, Lydd, Kent.

Deaths

GEE.—On Sunday, March 26, Charles Gee, L.D.S.Birm., passed away at his home, 32 Bath Street, Leek.

HICKMAN.—Suddenly, on March 22, 1950, at his residence, Sherwood, West Runton, Norfolk, Gilbert Henry Hickman, L.D.S., beloved husband of Dorothy Hickman.

SANDERS.—On April 3, at Bristol Homœopathic Hospital, Hubert John Sanders, of 15 Redland Grove, Bristol 6, after a brave fight.

Our Diary

Monday, April 24.

The Royal Society of Medicine—Odontological Section.—1, Wimpole Street, London, W.1, 5.30 p.m. Lecture by Professor Westin of Stockholm.

Tuesday, April 25.

Croydon and District Section.—Y.W.C.A., Lansdown Road, Croydon, 8.15 p.m. "Chairside Aids to Clinical Practice," G. H. Leatherman.

Metropolitan Branch.—Eastman Dental Clinic, Gray's Inn Road, London, W.C.1, 7.30 p.m. "Full Denture Prosthesis," Professor E. Matthews.

Preston, Leyland and Chorley Section.—Starkie House, Starkie Street, Preston, 7.30 p.m. Films by Imperial Chemical (Pharmaceuticals), Ltd.

Friday, April 28.

South Wales and Monmouthshire Branch.—Y.M.C.A., Page Street, Swansea, 7 p.m. "The Role of Infection in Everyday Dental Practice," Stewart Ross.

West Kent and District Section.—Annual Meeting, Wrotham Park Club, 8.15 p.m., preceded by informal dinner, 7.30 p.m.

West of Scotland Branch.—Royal Faculty of Physicians and Surgeons, 242 St. Vincent Street, Glasgow, C.2, 7.45 p.m. "Prevention of Dental Caries," Gilbert J. Parfitt, followed by film: "The Topical Application of Sodium Fluoride."

Friday and Saturday, April 28 *and* 29.

Northern Ireland Branch.—General Meeting, Londonderry.

Saturday, April 29.

Scottish Committee.—Station Hotel, Perth, 2 p.m.

Monday, May 1.

Worthing and District Section.—Amalgamation Dinner, Worthing Squash Club, 7.15 for 7.45 p.m.

Saturday, May 6.

The University College Hospital Dental Society.—Annual Clinical Meeting. Morning: Dental Hospital, Gt. Portland Street, London, W.1. Afternoon: Medical School, University Street, London, W.C.1. Dinner Dance, Dorchester Hotel, 7 for 7.30 p.m.

Wessex Branch.—Annual Meeting, Salisbury General Infirmary, 5 p.m. Informal Dinner, 6.30 for 7 p.m. 8 p.m.: "Crime and the Dentist," Dr. Keith Simpson.

Monday, May 8.

The British Society for the Study of Orthodontics.—Manson House, 26, Portland Place, London, W.1, 7.30 p.m., Demonstration Meeting.

Thursday, May 11.

Central Counties Branch.—Afternoon: Annual Golf Competition, Sutton Coldfield Golf Club, Streetly.

Friday and Saturday, May 12 *and* 13.

Western Counties Branch.—Annual Meeting, Queens Hotel, Cheltenham. Friday: Afternoon, Golf Competition, Lilleybrook Golf Club; 5.30 p.m., Council Meeting; 8 p.m., Reception and Dance, Queens Hotel. Saturday: 10.15 a.m., General Meeting, Presidential Addresses; 2.15 p.m., "Recent Cases of Interest," J. W. E. Snawdon, "Fundamental Principles and Uses of Plastics in Dentistry" (illustrated by colour film), A. C. Deverell; 4.30 p.m., Hospital Group Meeting; 7.30 p.m., Annual Dinner.

Thursday, May 18.

Public Dental Officers' Group—North Western Division.—Exchange Station Hotel, Liverpool, 2.30 p.m. "School Dental Service—Past and Its Future," T. H. Parsons.

Friday—Sunday, May 19-21.

Scottish Branches.—Conjoint Meeting, Hotel Hydro, Dunblane. Friday: 6 p.m., Address by J. M. Macrae; 7 p.m., Dinner. Saturday: Golf Outing and Competition, Dunblane Course.

BRITISH DENTAL JOURNAL

Communications with regard to editorial business should be addressed to THE EDITOR, *BRITISH DENTAL JOURNAL*, 13, Hill Street, Berkeley Square, London, W.1. Telephone: Grosvenor 2761. Telegrams: "Bridentics, Audley, London.

Original Articles and Letters submitted for publication are presumed to be offered to the *British Dental Journal* only, unless the contrary is stated.

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